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The
Fairbanks
Times



FAIRBANKS, ALASKA

April 3, 1910

To the Users of Independent Light, Heat and Water

We know this will be a prosperous year.
Because Independent Light, Heat & Water is so economical.
Have you made comparisons yet ?
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Prognostications are False! Read!

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We introduced the Tungsten and Tantalum!*

Had it not been for us, the people of Fairbanks would probably be using the old and expensive carbon lamps of two years ago.

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INDEPENDENT LIGHT, HEAT & WATER COMPANY

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K.V. Sept. 12/10

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D. H. CASCADEN, Vice-President.

DAVE PETREE, - - - Secretary-Treasurer.

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Reorganized and Incorporated
January 21, 1908.



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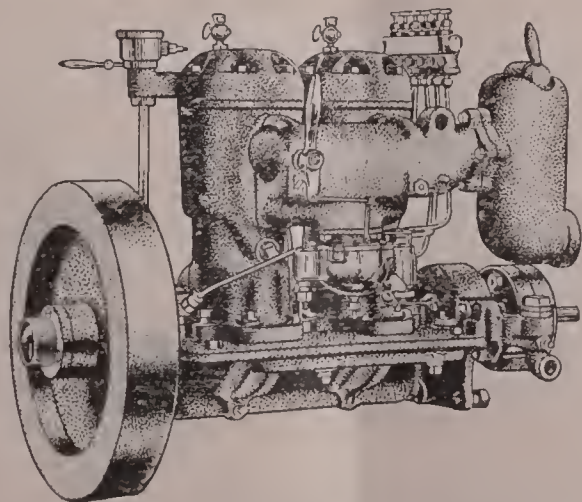
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The Fairbanks Times

"Made in Tanana"

Industrial Edition

SUPPLEMENT TO THE FAIRBANKS SUNDAY TIMES, FAIRBANKS, ALASKA, APRIL 3, 1910.

AN EMPIRE OUT OF WILDERNESS

*IN LESS THAN A DECADE A FEW THOUSAND PIONEERS HAVE CONVERTED THE HAUNTS OF
THE WILD BEAST INTO A FACTORY OF WEALTH.*



TEN years ago the Tanana valley was a wilderness, inhabited only by wild beasts, whose pedigrees ran back to the time when the Western hemisphere knew no human tenant; and by Indians, descendants of those earliest people who

tion of the Aztecs and the semi-civilization of the Apaches. Today, the Tanana valley is peopled with the pioneers of the most progressive nations of the world, and the valley hums with the tunes of modern industry. Here, the red blood of vigorous stocks is being blended in the arteries of a new and

a monument. During the ten short years that the white pioneer has tenanted the valley, he has added \$15,000,000 to the world's indestructible wealth. He has built towns and cleared the lands for fertile fields; he has connected his towns with railways and wagon roads and trails, and has strung



SUNSET ON THE TANANA RIVER.

followed the many-jointed tail of islands that point the way from Asia to America and who remained in Alaska while the main stream of the migration spread southward into the civiliza-

robust race.

Through the thousands of years that the native Indian was tenant of the valley, he lived, moved and had his being, and, when he died, left not even

a network of telegraph and telephone and wireless wires between; and from year to year the smokestacks have arisen in rapidly increasing number. During the year 1909, the Tanana val-

lev produced more than \$10,000,000 worth of golden wealth, and furnished a market for \$3,000,000 worth of merchandise from the states. All this has been done by a comparatively few people. At no time has the population of the valley exceeded 15,000 souls.

Two thousand miles of wilderness and ocean lie between the Tanana valley and the nearest point of unlimited supply. During the five months of summer and the open season, transportation lines, to arrive by water at Fairbanks from the nearest point of supply in the states, describe two sides of a triangle, and consume from two weeks to one month in transporting the supplies. When winter locks the gates of summer, the line of transportation seeks an avenue to the south coast, across two ranges of mountains, snow-clad and wind-swept. Geography is making of the people of the Tanana valley a race of Robinson Crusoes. They are learning rapidly to live on their own resources and to provide their own needs.

BEGINNINGS OF DIVERSITY.

The one great industry of the Tanana valley is the placer gold mining industry—hoisting from underground tunnels the gold-bearing gravels and separating the gold from the gravel. All other industry is secondary and subsidiary to this. The transportation lines exist to carry gold seekers and their supplies and machinery; banks and merchandise depots are established to serve the gold seeker in the facilitation of his business; shops,

foundries and factories are built to manufacture commodities and implements for the miner or for the purveyor to the miner. Eliminate mining, and the rest of the industries would disappear at the same time.

Nevertheless, these subsidiary industries are of growing importance and bid fair soon to constitute a prominent and permanent class by themselves. At the present time, the agricultural industry depends entirely for its existence in the Tanana valley upon the market furnished by the workers in the mines. With the increase in the number of miners demanded by the development of hard rock mines in the district, the farming area will increase. Finally, this industry will have reached such a stage of solidity that it will stand alone, independently of the mines.

So with other industries which are described in the following pages. They are only the beginnings of industries—the Tanana was a wilderness ten years ago; but they show what can be done. The raw material lies about on all sides; Alaska consists mostly of raw material. The power is at hand in various shapes—mountain streams that may be trained to lift valleys and to overturn hills, and huge deposits of coal that once unleashed will heat us and light us and do our work for ages to come. In a valley where a beneficent climate combines with the ever-present opportunity to acquire fortune rapidly, population is bound to multiply, and varied industry to assume a position of independence.

“Unto men of strength, and men of purpose, who can think and plan and dig and sweat and hope, Alaska offers the ‘Chance’ which may be had nowhere else upon this Earth.” All except a very few of the men who have acquired fortunes in the Tanana valley arrived in the valley with scarce a grubstake. Many of them possessed more faith than grub. It has been such as these who have built up the district and made of the Tanana a name that grows constantly in magnitude on the map of the world. Where else has a handful of penniless pioneers, with nothing but grit for capital and a remote and isolated wilderness as a field of operation, within so short a time brought into existence from nothingness an annual export trade of more than \$10,000,000 and an import trade of \$3,000,000? This has been done in the Tanana valley, and the possibilities and opportunities are as great today as they have ever been.

TRADE OF THE TANANA.

The growth of the Tanana is represented arithmetically as follows

YEAR—	Population.	Output.
1903.....	300	\$ 30,000
1904.....	3,000	350,000
1905.....	6,000	3,750,000
1906.....	8,000	9,175,000
1907.....	12,000	9,000,000
1908.....	12,000	10,500,000
1909.....	12,000	10,500,000

From the obverse point of view, the importance of the Tanana valley appears in the following arithmetical light:

VALUE OF MERCHANDISE SHIPPED FROM THE STATES.

	1905	1906	1907	1908	1909
Chena	\$ 219,699	\$ 468,479	\$ 483,003	\$ 509,699	\$ 259,643
Circle	51,495	49,357	46,617	83,114	74,243
Fairbanks.....	1,569,613	2,128,392	1,669,409	1,457,417	2,305,993
Hot Springs			23,415	73,512	71,840
Rampart	127,053	41,259	45,082	35,495	35,416
Tanana	77,943	143,567	176,240	147,026	210,964



FROM THE MINE TO THE MINT

By F. W. HAWKINS



THE earliest established industry in the Tanana, the output of which will always meet with a quick demand and a ready welcome, is that Factory of the Almighty, in which was fashioned every nugget, every grain and every color of gold which after a rest of millions of years, is now being turned into the service of man.

His instruments were the Ages, the travail of Mother Earth, the steaming new-born mountains with their bleeding veins, the rush of mighty waters, the all-embracing ice, the

The men who make the struggle against the natural conditions which exist in Alaska, and who wrest from the reluctant icy grip of Nature her hidden wealth, are entitled to a return for their gold dust as close to the theoretical value as can possibly be given. To arrive at that value, we must consider the distance which separates us from the mint; the time which must elapse during transit; the danger of robbery, of wreck; the expense of insurance, express or postage, all in addition to the actual professional and mechanical labor devoted to the local handling of bullion.

Each bank also employs a professional assayer, a man of high character, of specialized education, and long and arduous experience; there are no better men in that line in the world than the three men whose earnest, quiet, devoted services have been offered to the producers of the Tanana since 1905. The highest schools in France and America laid the foundations for their fitness; New York, Butte, Denver, Dawson added to this education the priceless experience of work. They are fit.

Into such hands is passed each lot of gold dust to be melted and assayed. Before being



TYPICAL PLACER MINING CREEK NEAR FAIRBANKS.

grinding glaciers, and the will of God was done.

For my part, I shall tell the story of gold from the time it is dug from the paystreak until the stamp of the United States is put upon it.

To care for the leading product of a country, to foster the industry which produces it, to assume the responsibility of handling immense values and to render a faithful accounting, is a useful and honorable business. The three banks in Fairbanks have handled probably 95 per cent of the output for the last five years, and this service has given absolute satisfaction to every producer.

Each of the banks has in its employ a man thoroughly familiar with the outward appearance of gold in its crude form of dust; from the experience of five years, he is qualified to offer a cash price for dust which is almost as high as an assay would yield; nearly all small amounts are so handled, but when the amount involved is above one thousand dollars, the more satisfactory method is as follows:

The depositor, who is usually a customer of the bank, is credited on his passbook with the value of his deposit figured at \$16 per ounce. This lot of dust is numbered and a complete record is kept of its further treatment.

put into the crucible, the gold dust is carefully mixed with borax and soda, in about equal quantities, which form chemical compounds with the foreign matter, about 2 per cent to 4½ per cent of the gross weight. This foreign matter is black sand, sometimes magnetic, dirt, iron, antimony, arsenic and tin.

A specially constructed gasoline blast furnace provides the necessary heat (gold melts at about 2,100 degrees and takes about thirty minutes); while in this molten state all impurities except the silver have combined with the soda and borax into a black glass, or slag, which floats readily on the surface of the gold. The melting of gold dust into

gold bars removes only the dirt and rock; the proportionate quantities of the constituent metals are not changed by melting. The molten gold is then poured into molds made to hold 50 ounces each, the slag separating from the gold instantly by forming a thin coating on the top of each bar. After cooling and wash, the bar is stamped with steel numbers, with the number previously assigned to that lot. A clipping, or boring, is then taken from each lot for assay. This clipping, valued at about \$2, is always added

of 1,000 gold weights, or 500 milligrammes; to this is added several times its weight of pure silver, the whole wrapped in sheet lead-foil and melted in a red-hot bone-ash cupel; this porous cupel absorbs everything but the alloy of silver and gold; this result is again rolled flat and the cornet is boiled in nitric acid, which eats all parts but the pure gold. This residue is then weighed upon the most delicate scales and its weight (possibly 881½ gold weights) represents the degree of purity which the bullion possesses. This degree is

parts are usually 113½ parts silver and 5 parts base metal in the thousand.

The basic formula upon which is founded the value of gold is as follows: **430 ounces of standard gold, 900 fine, is worth \$3,000.** This fineness, 900, is the fineness of the coinage of the United States, Germany, Italy and many other nations, not including Great Britain; the remaining 100 parts in the thousand are copper, and this alloy, nine to one, is called standard gold; this copper is used to harden the alloy and is furnished

by the government of the United States to all depositors of gold bullion at the price of 2 cents per ounce for each ounce used. Since there are 430 ounces of standard gold in \$8,000, it follows that there are 387 ounces of pure gold, 1,000 fine, in \$8,000, besides the 43 ounces of copper. Consequently, by dividing 8,000 by 387, we arrive at the value of one ounce of pure gold; this amount is \$20.671834625322997416—plus, an endless decimal of 21 places which repeats itself.

When the assayer has reported the fineness of a certain lot, the value is computed including the silver, and a deduction is made from this total theoretical value equal to 2½ per cent of this total. This net value in turn is reduced by the original deposit at \$16 per ounce, and the balance over and above \$16 is then credited to the depositor's account on the bank's book; the final credit is usually made within four or five days of the original deposit and the usual time taken for transit of shipment from Fairbanks to San Francisco is 21 days. So the producer finds at the bank a cash market for his gold on the average 16



to the value of the bar when the returns are made.

The bars are then weighed at the bank, each one separately, and prepared for mailing to the mint. Each bar becomes a special registered package and shipments leave Fairbanks for the mint on every mail during the summer, and about twice a month during winter. The representative of the bank at San Francisco or Seattle is advised by wire the number of packages and the total value of the shipment. The San Francisco agent of Lloyds Insurance is also advised by wire, and they assume the risk of loss up to the door of the mint instantly upon the sending of this telegraphic advice. Every precaution is taken on the boats and trains, but the risk is so great, that ordinary business prudence makes it imperative that this liability be assumed by corporations organized and prepared for just such business. For this insurance a necessary charge is paid by the bank and constitutes a part of the charge made by the bank against the producer.

The clipping, taken from each lot as mentioned above, affords the basis of the assay upon which the value of the whole is determined; this process is long and complicated, decidedly technical, but upon its result depends the satisfaction of each deal; it may be described briefly as follows:

The clipping being taken from a bar, possesses all the qualities of that bar; it is as near to pure gold as is the bar; it contains as much silver as does the bar; the question to be determined is, the purity of the mass. The clipping is first pounded flat and rolled until it is about as thick as paper; then it is trimmed to the exact weight



TWO TANANA MINING SCENES.

called the "Fineness," is measured and written in thousandths and is used to determine the value per ounce. The fineness simply means the proportion which the weight of pure gold contained in a given quantity of alloy bears to the whole of that quantity. Suppose the assayer reports a fineness of 881½, which is about the fineness of gold from lower Vault creek; this means that in 1,000 parts of bullion by weight, 881½ parts by weight are pure gold; the remaining 118½

days before the bank gets credit at San Francisco. The interest at 1 per cent on \$10,000,000, the output for 1909, for 16 days is over \$50,000. In analyzing this charge of 2½ per cent, this item of interest at 12 per cent per annum may be fairly set at \$65,000, since the bank's customer has credit the minute he passes the gold over the counter for nine-tenths of its total value. Therefore the community has the use of \$9,000,000 for 20 days, and \$1,000,000 for 15 days before the

bank gets its credit at San Francisco. The producer should consider that the total deduction for all purposes made by the banks in Fairbanks, 2½ per cent, which includes and absorbs all charges by the government, is exactly equal to the Dominion export tax at Dawson, Yukon.

To maintain harmony in this work, the producer must have confidence in his bank, and to deserve this confidence the bank must be as candid with the customer as the confidential nature of the business will permit. The banks are always ready to afford a customer or depositor of gold dust the freest access to the assay office during the operations on his dust; he is welcome to see the work from beginning to the end; he may have, if he chooses, an extra clipping from the bullion to submit to any other competent

assayer. Nearly every important lot of bullion is melted separately at the mint, and a report from the mint on his particular deposit may easily be secured by any producer.

Mutual confidence and respect will clear away the clouds of difference and do much to establish a lasting harmony.

A great deal has been written of late suggesting that, to the increased production of gold, may be attributed the world-wide rise in prices of most commodities; the truth of this theory is not clearly established to my mind, yet the question opens a very interesting field for meditation. It does appear certain that the addition of hundreds of millions of new gold to the money of the world, and particularly if it be in the hands of laboring producers, WHOSE DESIRES ARE UNSAT-

ISFIED, must of necessity create a new and more regular demand for labor at an advanced wage scale. This increase in the volume of money should not, however, enlarge the fixed incomes of capitalists, nor the salaries of regularly employed non-producers. It should have the effect of reducing the purchasing and earning power of money.

It does appear, therefore, that remote as we are from financial centers, our product has some effect on the freedom of ready money, and we may be satisfied that we are rendering a good account of ourselves and occupy a useful position in the scheme of civilization. We are, to a certain degree, improving the living conditions of some of the race of men, and that is a sufficient warrant for our existence.

The Metallurgy of Gold in Fairbanks

PROCESS OF MELTING, REFINING AND ASSAYING GOLD AT THE FIRST NATIONAL BANK ASSAY

OFFICE. BY C. E. BERAUD.



GOLD, the most potent substance on the surface of our planet, is justly called the "King of Metals." It is desired by all nations and is the one metal the supply of which never exceeds the demand. It is mostly found in its native state, and is remarkable on account of its unique and beautiful color, high specific gravity and freedom from liability to rust or tarnish when exposed to the atmosphere. Like all other metals, there is no recorded instance of gold having been found in an absolutely pure state. It is the most ductile and malleable of all metals known. It can be beaten into leaves 1-250,000 inch in thickness, while one grain of it can be drawn out into a wire 500 feet long. It is one of the most valuable metals. At the mint it is worth in round numbers \$248 per pound. Yet, it may be interesting to know that in the manufacture of metals for commercial purposes, that one pound of wrought iron, which is worth about five cents, can be turned into a value of \$16,000, this being the price quoted for one pound of hair springs in the manufacture of watches.

PROCESS OF MELTING.

Thus far very nearly all of the gold which has been sent to the different assay offices of Fairbanks has been the production of placer mines, and naturally washed from alluvial deposits. This gold dust having been extracted from gravels, is always associated with a large amount of impurities, partly because the auriferous gravels are generally a conglomeration of minerals of different nature, such as lead, antimony, zinc, copper, iron, etc., and from other sources of earthy composition, all of which are of more or less high specific gravity, and are retained in small particles in sluice boxes with the gold dust. Moreover, in placer mining operations, very often the ground is strewn with debris of every description,

such as iron nails, lead shot from cartridges, pieces of steel wire from the wearing of cables, etc., and in the operation termed "clean-up" a certain percentage of these materials cannot be separated from the gold; consequently, they are melted together and constitute what is known as the base metals in bar bullion.

The practice of melting in Fairbanks is practically the same as that in use in the United States assay offices. When the gold dust is received at the assay office a preliminary examination is made to ascertain the quantity and the nature of base metals present. This is done in order to enable



A BIG TANANA DUMP.

the assayer to use the proper kind of fluxes, so as to leave the gold bullion as free as possible from impurities. The fluxes generally used are powdered borax, borax glass, bicarbonate of soda, and carbonate of potassium. The gold dust with its required fluxes is then introduced into a crucible made of a composition of graphite (black lead) which has been previously annealed. The annealing operation is very necessary for the reason that a new crucible if suddenly heated may fly to pieces and cause the loss of much gold.

The crucible is now placed in the fur-

nace and the act of melting takes place. During this procedure the metal is transformed into a molten state, and this molten mass undergoes a chemical reaction. The gold is gradually liberated from its impurities, which rise to the surface. This chemical change can be readily understood. It is simply the law of gravity. The gold being much heavier than its impurities, the lighter metals are forced to the surface. These metals are desulphurized and oxidized by the chemical action of the fluxes and with the other earthy elements as quartz, etc., they form what is known as slag. As soon as the fusion has been entirely effected, the slag should be skimmed off and the gold poured into ingot moulds, as the unnecessary prolongation of the slag in the crucibles will, under the chemical action of its different ingredients, gradually consume the inside of the crucible, therefore making it so weak that there will be danger of the crucible leaking and the gold being spilled into the furnace.

THE FURNACES.

The melting furnaces are made entirely of fire clay, and are about the same shape as an air tight heater. The fuel used is gasoline of 72 degrees. This kind of fuel is very convenient for general assay work, as it enables the assayer to regulate the necessary amount of heat required for the different metallurgical operations. The gasoline is carried to the furnaces from a cylindrical tank made of heavy galvanized iron, provided with a pressure gauge, and an air forcing pump. This tank is so constructed as to resist a pressure of 100 pounds to the square inch.

The fuel distribution pipe is connected with the generator or burner which is known as the Carry hydro-carbon burner. This burner insures a perfect combustion of the fuel and is capable of generating over 2,500 degrees of heat (Fahr.), and by using pure

oxygen and ordinary gas combined instead of gasoline, the melting point of platinum (which is about 3300 degrees Fahr.) can be obtained.

The melting point of gold is 2016, and iridium, which is the most difficult metal to melt, requires a temperature of 4532 degrees (Fahr.).

REFINING.

The entire process of refining the gold bullion is not performed by the assayers of Fairbanks, because it involves a great many different operations, which would be unnecessary, the United States mint buying the gold bullion regardless of its fineness. The only refining done in Fairbanks is merely to insure a uniform fineness in the bar bullion to be assayed.

When the gold dust is contaminated

lion poured rapidly into ingot moulds.

In case the gold dust contains a certain quantity of lead of any description the flux must contain an equal quantity of bone-ash in ratio to the amount of other chemicals used, and when the slag has been skimmed off some bi-chloride of mercury is used instead of potassium nitrate, as in the case of iron and antimony.

When the gold dust contains some other impurities, such as tungsten, tin, zinc, arsenical pyrites, cadmium, chromium, etc., the fluxes must contain a small percentage of nitre, bi-tartrate of potassium, potassium cyanide, ammonium chloride, sodium chloride, soda lime, calcium chloride, as the case may be.

It may be stated here that all the impurities above described have a tendency to make the gold bar brittle, and consequently

that the bar is not uniform it is remelted and refined, as has already been explained.

The sample thus obtained is now flattened on an anvil, and repeatedly passed through a roller until it has attained the thickness of a postal card. It is then thoroughly cleaned and 500 milligrammes of it is accurately weighed on the assay balance. (The assay balance used at the First National Bank is the Troemner No. 08, and has a guaranteed stable sensibility of 1-200 of a milligramme). It is then wrapped in a small piece of pure lead foil and cupelled. The cupels are vessels somewhat resembling scorifiers in shape, made of pure bone-ash, which has the property of absorbing molten oxide of lead. The latter dissolves other oxides which may be present, carrying them with it into the pores of the cupel. Base metals are thus separated from



A GROUP OF TANANA GOLD BRICKS.

with a large amount of impurities, such as iron and antimony, the gold dust is melted first with a flux composed of three parts of carbonate of soda and two parts of borax. When the fusion is complete it is well stirred with a stick of compressed plumbago previously heated to red heat. The stirring helps the impurities to rise to the surface of the molten gold. They are then carefully skimmed off and a small quantity of potassium nitrate is thrown into the crucible, repeating the operation every four or five minutes, as the case may be.

A new flux, composed of equal parts of sodium carbonate, borax and bone-ash, is put into the crucible, and the temperature raised. When this flux is in perfect fusion the whole is again well stirred, the slag skimmed off as before and the molten bul-

lion of a doubtful homogeneity. This being the case, the assay showing the value of the gold bar will also be doubtful. In fact, the idea of refining is to eliminate as much as possible these different impurities in order to render the bar bullion homogeneous, thus preventing error in the assaying.

PROCESS OF ASSAYING.

The process of assaying gold bullion is simply one of refining. After gold dust has been properly melted, partially refined and cast into ingots a sample is then taken for assaying. The sampling of ingot or bar bullion is done by chipping off the diagonally opposite upper and lower corners, having previously removed a portion so as to expose a fresh surface. The sample is then examined, and if there is reason to suspect

the unoxidable metals, such as gold, silver, platinum, etc.

As stated above, the sample of gold bullion being wrapped in lead foil is introduced into a hot cupel in the muffle of the furnace and there the process of cupellation takes place. As soon as the lead begins to drive, the door of the muffle must be opened to reduce the heat and insure a current of air through the muffle, which air helps the oxidation of the lead. When the greater part of the lead has been thus converted into litharge (oxide of lead) and absorbed, the remaining bead of rich alloy suddenly becomes opaque and glowing. This is a sign that the process is on the point of cupellation, and the heat of the furnace is now increased to insure the expulsion of the last remaining portions of lead. Im-

mediately after the disappearance of the last traces of lead, the peculiar action known as "brightening" takes place, when the metal is observed to emit brilliant flashes of light, and solidifies. If the cupellation has been well performed, the precious metals in the cupel should be in a state of almost chemical purity. The cupel is removed from the muffle, allowed to cool and the precious metals, which are now in the form of a bead or button, are carefully weighed and the dif-

During the sluicing period in the Tanana valley, a large number of gold bullion assays are made, over 3,000 assays being done at the First National Bank assay office during the season of 1909.

The platinum apparatus used for parting consists of a shallow pure platinum dish, with a rack containing a number of divisions, each holding a small perforated thimble-shaped vessel, likewise of pure platinum, which permits of free entrance of the acid contained in the dish.

The cornets mentioned above are put in

solution being poured off as before, and finally the cornets are boiled in pure acid. The rack is then transferred to another dish containing pure distilled water, boiled to wash out the nitrate of silver from the cornets, and is placed in a red hot muffle where they are annealed, then allowed to cool and carefully weighed. This weight indicates the exact fineness of the gold bullion assayed, providing the operations of cupellation and parting have been properly conducted.

The difference between this last weight



ference from the original weight is the total amount of impurities or base metals contained in the bullion.

The base metals having been estimated, the bead is now roughly tested to ascertain the amount of silver which it may contain; then a calculated weight of pure silver is added to form an alloy of $2\frac{1}{2}$ parts of silver to 1 part of gold. The whole is wrapped with 50-1000 of pure copper in about 5 grammes of lead foil, and cupelled as before.

THE PARTING PROCESS.

The bead of gold and silver from the bead of cupellation is hammered out on an anvil with a clean hammer, and rolled out into a flat strip of the thickness of a thin visiting card. This strip is annealed and rolled into a small spiral or cornet, which is then treated with acids, as later described. When only few assays are made, the treatment of the cornets with acids is done in a small glass flask, otherwise it is generally performed in a platinum apparatus.

the thimble vessels, and the rack lowered into the dish, which is partly filled with nitric acid and distilled water (the composition being 2 parts of water and 1 part of acid), and gently boiled for ten minutes until all the brown fumes have disappeared. The rack is now raised, the acid is drained from all the vessels and the silver solution from the dish is poured off. The rack is then put back in the dish with a stronger acid of the proportion of $1\frac{1}{2}$ acid to 1 of water, and boiled again for ten minutes, the

and the weight of the bead before parting gives the exact amount of silver contained in the bullion.

IN CONCLUSION.

Assuming that 1000 milligrammes of bullion have been taken for assay, and the bead of metal obtained from the first cupellation weighs 900 milligrammes, it is seen that the original bead has lost 100 milligrammes in weight, and as hereinbefore explained the cupel absorbing only the oxidizable metals, the loss is consequently the amount of base metals which were in the bullion. Now the product of the second cupellation being gold and silver (except if some metals belonging to the platinum group were present) after having been separated through the operation of "parting," the cornet or last remnant of the first weight of bullion taken is found to weigh 780 milligrammes; hence, 900 milligrammes of "precious metals," less 870 "pure gold," equals 120 "silver," which would be tabulated as follows:

"Gold," fineness 870. "Silver," fineness 120. "Base Metals," 100.



THE N. C. MACHINE SHOPS

WHERE ANYTHING FROM A HAIRSPRING TO A RAILWAY LOCOMOTIVE MAY BE MANUFACTURED.

A HOSPITAL FOR ALL KINDS OF IMPLEMENTS.



PROBABLY few people who hear the ringing anvils and whirring of machinery as they pass the Northern Commercial Company's machine shops at the corner of Third and Turner streets realize the volume and nature of the work accomplished there and the important bearing it has upon the industries of the Tanana valley. But a trip through these roomy, well-lighted shops and an inspection of the modern, up-to-date labor-saving devices, and the big machines performing their allotted tasks, under the direction of a corps of skilled mechanics, in a manner positively uncanny in its suggestion of human intelligence, will fairly open one's eyes in surprise and quickly disabuse the mind of any erroneous idea it may have held as to the ephemeral nature of this camp and its lack of permanent industries.

INTELLIGENT MACHINERY.

These shops are equipped with two large lathes of the most approved pattern and capable of handling any piece of work that the needs of the diversified operations of the Tanana valley may require.

A shaper which smooths and fashions articles of iron in a manner similar to that of a planer in a sawmill.

A bolt machine, which threads bolts and nuts and turns out the finished article at a remarkable rate of speed, and with absolute accuracy.

A cut-off saw which eats through six-inch bars of iron like so much cord-wood.

A band-saw for sawing iron in curves, circles, scrolls and curlicues.

A power shear which cuts boiler plate as a tailor snips cloth.

Bending rolls for bending large sheets of steel in the manufacture of boilers.

Two large drill presses with all sorts of automatic devices for raising, lowering, extending, swinging in a circle, and adjusting for every kind of work imaginable. These machines can drill any kind of hole through any kind of material, at any angle, and can do almost everything but bore a hole around a corner.

A gigantic steam hammer which beats and batters huge pieces of red-hot iron into any shape or form the fancy of the blacksmith may desire.

A traveling crane capable of lifting and carrying a weight of $1\frac{1}{2}$ tons to any part of the shop.

A large force of competent machinists, blacksmiths, electricians, boiler makers and mechanics are kept constantly employed in manufacturing and repair work, and the jobs that come to the shop are many and varied and often unique in character.

Here is brought repair work from all the mines in the interior—from Eagle to Kaltag on the Yukon, from the Innoko and Koyukuk regions, from the Bonfield and Kantishna, and from the whole length of the Tanana and its tributaries. Here also come for repairs the plows and agricultural implements of the farmers; machinery parts from the sawmills, breweries, electric light plants, steam laundries, print shops and other mechanical industries of the region; the fish wheels of Chena; typewriters from the offices; sewing machines from the homes; car wheels and locomotive parts from the railroad, and the vital parts of the many steamboats that ply the Yukon river and its tributaries.

HAIRSPRING FROM OLD FILE.

It is claimed for the shop that it can make anything in iron from a needle to an anchor, and repair anything from a watch to a locomotive. It is the justifiable boast of Joe Mathews, the master mechanic, that they have never yet been stuck, but have been able to do every job that presented itself. His proudest achievement, aside from repairing the cylinders of the steamer Schwatka two years ago, was the manufacture of a hairspring for a watch from an old file.

The shop is called upon to face many problems that are never presented to even the biggest shops on the Outside, for the reason that out there when a piece of machinery is badly broken it is thrown on the scrap heap and a new part obtained from the factory. But here a whole season's work would be lost if this course had to be adopted, so the mechanics of the Northern Commercial Company are called upon to exercise their ingenuity and resourcefulness and repair everything that comes their way to the end that the development of the camp may continue uninterrupted in its progress. And no better proof of the resourcefulness and adaptability of the men of the North

could be required than the fact that these mechanics have been able to meet every emergency with which they have been confronted, and have done some of the most difficult repair work that any machine shop was ever called upon to handle, and which in a number of instances involved the designing and manufacture of special tools for the purpose.

A BASKET OF SCRAPS.

A case in point is that of the repairing of the cylinders of the steamer Schwatka when the cylinder heads blew out and shattered the engine into a shapeless wreck that had to be carted to the shop almost in baskets. In any ordinary country the engine would have been consigned to the scrap heap and a new one installed, but the accident occurred at a critical time in the shipping season, when the water was falling, the close of navigation rapidly approaching, hundreds of tons of perishable freight waiting at Gibbon, and every boat on the river with all the work it could handle for the remainder of the season. The cylinders were rushed to Chena by one of the other boats, brought up on a special train, and in exactly four days the steamer Schwatka was back to work with her engines repaired and reinforced and in as good condition as the day they first went into commission. And the job was done at a total expense of much less than the cost of new cylinders.

Among the numerous unique tasks performed by the shop was the construction of a diving suit for use in the attempt to raise the steamer Rock Island, which was wrecked at Chena in the spring of 1906.

When not engaged in repair work the facilities of the shop are employed in the manufacture of carriers, buckets, scrapers, points, prospecting boilers and various other appliances and contrivances used in the mining and other industries of the Tanana valley.

In addition to operating the machine shops, the Northern Commercial Company furnishes electric light and steam-heat service to the town of Fairbanks, supplies water service with a standing pressure for fire fighting purposes, operates a line of steamers and barges on the Tanana, Yukon and tributary rivers, and is engaged in the general merchandise business in all the important camps in interior Alaska.



The B., H. & K. FOUNDRY *and* SHOPS

BIG AND IMPORTANT CASTINGS HAVE BEEN TURNED OUT BY THIS NECESSARY FAIRBANKS
INSTITUTION.



HE old proverb that "Necessity Knows No Law" was probably constructed in the first place to fit the case of some old cave-dweller who was under indictment for an infraction of the game laws of his time. Here in the Tanana its truth is pointed along more moral, and certainly along more useful, lines. Even the laws of Nature, that stern old lady who dominates almost every other part of the world, have been set at naught by the necessity which ordains that Progress and Work in the Tanana shall pursue an uninterrupted course. Dame Nature has willed it that for half of a year the country shall be isolated, so far as many commercial purposes are concerned, from the outside world, and has imposed upon its merchants and miners the necessity of thinking for a year ahead, and, like some of the animals of a lower order, laying up supplies wherewith to tide over the steel bound months of winter. Time was when, under certain conditions, the old lady's scheme for delaying the rape of her store of riches worked to a charm and, in accordance with her plan, the wheels of industry failed to revolve. Those were the days when machinery brought into the country to uncover its riches failed of its purpose by reason of a flaw in its construction or the stress of wear of its continued toil. Then the old lady smiled, knowing that she had so hedged around her strongbox with inaccessibility that it was impossible for the weakened or broken parts to be replaced in time from the workshops of the Outside, and that the work of delving must, perforce, be ceased.

That time has come to an end, however, for now there is hardly any piece of machinery that is used in the country, on steamboat, in mining operations or workshop, that cannot be replaced by parts constructed right here in Fairbanks. For years Ingenuity was brought to play when machinery in whole or in its integral parts refused to do its allotted work, and many holes were stopped by clever makeshifts. Invention, however, has its limit, and is unable to construct without material at hand. Broken parts of heavy steamboat machinery, for instance, must needs be cast before they can be shaped to do their work; and some of the smaller parts of boilers, such as grate bars, for instance, can only be furnished satisfactorily, or at anything like a

reasonable cost, from cast iron. To shape them from wrought iron would make the cost prohibitive and consume so long a time as is not always available.

CASTING AN INTAKE.

It was with this idea in mind that Brumbaugh, Hamilton & Kellogg installed their foundry in connection with their machine shops on Garden Island. And from out this factory it is possible to turn anything in the way of castings, from one weighing nearly fifteen hundred pounds to the smallest casting that is likely to be needed for any piece of machinery. When the Tanana Electric company, at its plant on Poker creek, needed an intake from its pipe line to the turbines, it was no trick for the B. H. & K. outfit to turn it out, although it called for a casting weighing 1,200 pounds. Neither, if a mining operator finds the smallest casting of his pump broken through a flaw, is it a matter of a long wait before the broken part can be replaced with a new one, made either of cast iron or brass.

When the Times man called at the factory to be enlightened as to some of the possibilities he saw lying on the floor the suction side of an eight-inch Morris centrifugal pump. Holes had been worn through it sides by the action of the sand and small gravel and it had been rendered useless for its work. The other parts of the pump were in such condition as promised effective work for many years, but the whole pump had been rendered useless by the holes in the side. And so, just as a matter of course, this side was shipped to the foundry and a casting, weighing between three and four hundred pounds, identical with the one that left the factory in the first place, will be made and fitted to the pump and put it in a state of efficiency which will permit of its doing its work for its allotted span.

WINCH FOR JULIA B.

When the big steamer Julia B. was up here the summer before last a big section of her winch was broken. Repair was out of the question without a casting, and so a pattern was made by the B. H. & K. patternman and a section cast and fitted, enabling the Julia B. to use the winch which otherwise would have been out of commission until the next summer. It was during

the winter that the quartz prospects of the Tanana developed to such an extent that a stamp mill was considered necessary to make tests. The bringing in of one over the ice was out of the question. So, although the job entailed the making of original patterns throughout, Brumbaugh, Hamilton & Kellogg just went ahead and made one.

And so it goes, whenever anything untoward occurs to machinery there is now no reason for any extraordinary delay. The foundry is busy summer and winter on work topical to the seasons. In the winter the general repair work incidental to the operations in the mines keeps the men from getting slack and in the summer there are steamboats of all sizes which constantly are wanting something to complete their equipment.

A BUSY MACHINE SHOP.

In connection with the foundry there is the machine shop, one which would compare favorably with many of the large ones on the Outside. Here are lathes running as large as 30 inches on a sixteen-foot bed, capable of handling the drivers for locomotives or steamboat shafts. Power punches and shears which will cut or punch holes through boiler plate of an inch thickness. Drill presses of or a radial sufficient to bore out anything up to seven feet in diameter. A Williams pipe and bolt machine for handling anything up to four or five-inch pipe. A shaper for light planing and key seating. A bandsaw for pattern work, a 400-pound steam hammer that can easily do any welding necessary on a five-inch steamboat shaft. A Westinghouse air compressor with pneumatic hammers for riveting, and practically everything else that is needed to do the varied kinds of work that is brought to the shop.

The plant is furnished steam from a forty-horsepower boiler. The building is 100 by 150 feet and up to it runs a spur track of the Tanana Valley railroad, the cars going into the warehouse direct. There are eight men working in the machine shop and foundry and six are employed in other capacities. The company always carries on hand a large stock of boilers, engines, hoists, pumps, cable, pipes and fitting in addition to what it manufactures right in Fairbanks. Among the articles made here are patent steam points, carriers for mining, Samson drillers, Bagley scrapers, scraping blocks and gin blocks.



Where Our River Boats are Built and Mended



*The railroad's mighty useful, and should it only come,
The steamboat may be pensioned and have to stay at home;
But in the meantime Tanana, for all it needs to eat,
And operate its mines with, depends upon its fleet.*

—Shipyard Stripling.



FAIRBANKS, for commercial purposes, is practically dependent on the navigability of the Tanana river and the Chena slough. These are the highways over which is brought all but an insignificant amount of its freight and the only line of communication open to it during the summer months. Occasionally a few of the larger boats are able to make the run up the slough, but more often the stage of water prohibits this. That they ever come, and that generally four or five of the fleet of the Northern Navigation company are wintered here, is conditioned on the fact that excellent shipyard facilities are to be had and that practically any repairs needful may be made here.

Breakages of machinery find a well-equipped hospital in either of the two large machine shops; and the more simple fractures, those of the ribs and the like, can be attended to, with promptitude and dispatch and a minimum of pain, at the large shipyard maintained by the Northern Navigation company at the lower end of town.

A BIG PAYROLL.

This shipyard is so well equipped that it is not only possible to make all the necessary repairs to any of the company's boats, of a length not exceeding one hundred and fifty feet, but, if occasion required, vessels could be built there. The yard, especially during the spring, just prior to the opening of navigation, is operated on a scale much more extensive than is appreciated even by residents of Fairbanks. For instance, few realize that last spring when the boats were being made ready for their summer's work there were more than one hundred men at work at the yards whose daily payroll amounted to \$752.

While the yard here has all the facilities for building boats, its operations so far have been confined to repair work, the building for the company being all done at St. Michael, where a much larger yard and mill are maintained. That the yard can handle heavy work, however, was demonstrated in the spring of 1907, when the journals of the four-ton shaft of the steamer Tanana had to be turned down. Because of the length and weight of this large piece of steel, it was impossible to put it in any lathe that was here at that time. To get around this difficulty the huge shaft was raised and placed in wooden pillar blocks. A small motor to supply the power to turn the shaft was then placed under the boat and connected

with the shaft with belts. The turning took two days of constant work.

Last spring the biggest undertakings at the yards were the placing of a new set of cylinder timbers in the steamer Tanana and the rechaining and restrengthening of the steamer Schwatka. Besides this work the Schwatka, Tanana, Delta, Reliance and Koyukuk were thoroughly overhauled on the ways, the capacity of the latter being sufficient to permit of all the boats being berthed at the same time. This work included repairs and renewals to the engines, boilers, hulls, houses, staterooms and cabins, and the painting from top to bottom, inside and out, of all five vessels.

A COMPLETE PLANT.

The "plant" at the yards consists of a set of ways one hundred and fifty feet wide, and one hundred and ninety feet long, so rigged as to permit of the operation of five

The shipbuilding facilities of Fairbanks, however, are by no means confined to the big company's yards, for craft of all descriptions, from the steamer White Seal down to small poling boats and rafts, have been turned out on the banks of the slough, most of the smaller type to be used in stampedes or on prospecting trips. Some few boats, however, of the motor type, have been constructed almost entirely for pleasure craft, and the probabilities are that the number of these will be augmented this coming summer.

During the stampedes to the Kantishna, Innoko and Iditarod, there were daily departures of home-made boats of all descriptions. It is doubtful if the Hudson-Fulton parade showed any greater diversity in construction for almost everything that would float, or was believed capable of floating, was pressed into service. Some of the side wheelers lacked the graceful lines, but most of them demonstrated their usefulness by landing



crabs; a planing mill with electrically driven machinery, including bandsaw and shaper; a fully equipped blacksmith shop, four warehouses, an office, two messhouses and two dormitories.

Two of the warehouses are stocked with boat stores, one with the gear used at the yard, and another contains the steward's stores. The office has living rooms in connection for the clerical staff. The large messhouse for the men has rooms overhead for the steward's department; the other messhouse is for the officers. One of the dormitories is used by the men and the other by the officers.

their owners at the places they wished to reach. Many were built by the prospectors themselves, while others were made at the small boatbuilding establishments which do a flourishing business during the spring and summer months.

THE WHITE SEAL.

The largest boat ever constructed here was the White Seal. This taut little craft, which is always busily engaged in making runs up the Tanana, down to the Innoko or Iditarod, or up to Dawson, is one hundred feet long, with a beam of twenty feet. She was built for Captain Sproule, George Cole-

man and Bert Smith in the spring of 1905. At that time, before the railroad was built, there was a deal of freighting to do on the slough, and a boat that could make the maximum speed on a minimum supply of water was a necessity. So the White Seal came into being, as most things do in the Tanana when necessity for them arises. She was built to draw but seven inches of water, and had a capacity of about 120 tons. It took about a dozen men to build her and she was turned out in seven weeks, completed from stem to stern, with the exception of her engines and boiler, with home made material. She is the only boat plying these waters which has the distinction of being built with over-the-ice nails, these having been freighted from Dawson. Her bolts were all turned in Fairbanks. Her boilers at that time were 65 horsepower, but these have been greatly augmented since. The native lumber used in her construction has stood the test well and the vessel has demonstrated, by its long career of usefulness, that Fairbanks craft compare favorably with those built elsewhere.

MOTOR BOAT INDUSTRY.

Sam Jensen, of Graehl, the unpretentious village across the river from Fairbanks, has established himself in a complete ship-building plant for the construction of motor boats and all manner of smaller river craft in the way of poling and row boats. Each season he has sold many hundreds of "small boats" of every conceivable shape, which have plied every portion of the inland waters of Alaska and have assisted materially in the upbuilding of this great Empire.

Mr. Jensen has just completed a motor launch for Charles E. Freeman of Fairbanks, for use on the local rivers this summer. The boat, by name the "Emmaline," has 28-foot beam and is of the river type, that is, narrow and trim, with four and a half foot beam. One Gray six-horsepower two-cylinder engine will furnish the motive power, the engine having been brought in last summer by the owner of the new boat. It is figured

that this boat should be able to climb the steep waters of the Tanana and Nenana rivers without difficulty, at the rate of five miles per hour, and this speed is taking into consideration that the Tanana river runs a current of from four and a half to eight miles an hour, according to locality.

The Emmaline is rigged up mostly as a pleasure craft, but can be stripped to carry freight, and with a carrying capacity amounting to three or four people, she will draw eighteen inches of water. The craft is

tive spruce three-quarters of an inch thick, and is calculated to withstand any ordinary kind of usage or accident, at a cost of \$225, which is very little less than actual Outside construction. Alongside of the Emmaline lies a motor boat but 24 feet in length, which was built outside at a cost of \$1,300, and which is not as trim as the home-made article. The imported craft is made of cedar, but experts say that wood would withstand no more usage than the native spruce.

At the same shipyards was constructed



ALONG THE TANANA RIVER.

figured to burn gasoline at the rate of seven and one-half gallons for a ten-hour run, at full speed. This fuel is carried in the bow in a 16-gallon tank, and extra fuel is carried in each end in lockers made for that purpose. She will seat sixteen people comfortably and loaded thus will draw twenty-four inches of water.

The hull of this boat was made of na-

the trim little "Dorothy," a local motor boat, which has proved a gem, and has operated on the river as a pleasure craft or for practicable purposes for a couple of seasons. Mr. Jensen prognosticates the best season yet for craft of all sorts this summer, as the placer and hard rock finds in isolated localities are keeping prospectors on the constant jump.

German Beer Follows the American Flag

THE BARTHEL BREWERY IS TURNING OUT A PRODUCT THAT EXCLUDES IMPORTATION FROM THE STATES.

While the dictum that the Constitution follows the flag may still fail of acceptance by all, there is little doubt in the minds of those who have reached out after the frontier that beer certainly does. Given a population of about one hundred Americans and at least one German, it's a safe bet that a brewery site will be among the locations filed on the townsite plat, provided there is located handily more than enough water than is absolutely necessary for washing purposes.

Under certain conditions it is conceivable that the washing might be made a rather periodic affair rather than it should interfere with the operations at the beer factory. This, of course, by reason of the

high moral standard and partiality to cleanliness of most Americans, is not always the case and the writer distinctly remembers the time when he had to go without his beer on certain days, because Mrs. Hogan was using her washtub, the only vat available in which beer could be brewed.

All of which goes to demonstrate that beer has become the national beverage for Americans who do not entirely eschew fermented liquors—a condition of affairs acknowledged as highly satisfactory by those even who are among the greatest opponents of intemperance. Therefore it would have been strange if Fairbanks did not count among its numerous industries a brewery. Not so remarkable, however, as is the fact

that that brewery is one which would hold its own in point of equipment and capacity with those located on the Outside in cities of ten times its size.

Such is the case, however, for the Barthel Brewing company operates a plant in Fairbanks quite capable of catering to the wants of cities the size of Berkeley, Fresno or Leadville and there is little danger of Fairbanks outgrowing its brewery for some years to come. And, what is more to the point, Fairbanks home brewed beer, by reason of the excellent water peculiarly fitted for its manufacture, and the capable corps of brewers employed therein, is the equal of that made in any part of the country. It is a fact that the great

majority of the people in the camp drink the local product in preference to that shipped in from the Outside.

GERMAN EXPERTS.

The Barthel brewery is located at the west end of town and is run under the direction of Herman Barthel, who for more than forty years has been engaged in the brewing of beer. Learning his trade in Prussia until he had become thoroughly expert, he came to the United States and was connected with some of the largest breweries of the country. For only two years he worked as a journeyman brewer, the rest of the time being engaged as foreman or running his own brewery. For his foreman at the local brewery he has Rhinehart Effinger, a man who also has learned his trade in the old country and been engaged in it ever since.

The main building of the brewery is 40 by 70, and four stories high. In connection are two cellars 15 feet high. The brewhouse is 40 by 20 with two storerooms on top and the engine room is 26 by 30, with a storeroom above. There is a capacity of 150 tons of storage in the brewery, be-

sides the hot and cold water tanks. In the icehouse there are 300 tons of ice, and the fact that the cellars are built six feet underground obviates the necessity of a much greater amount being used.

The brewhouse has a capacity of 100 barrels a day, and if the storage were augmented by the addition of more steel vacuum tanks that of the cellars would be equal to this. The bottling department is equipped with apparatus capable of bottling 30 barrels a day, just enough to give every resident of the camp about one bottle apiece every day.

IT'S THE WATER.

A vast quantity of hops and malt is used in the brewery in the course of a year, the malt coming from St. Louis and the hops from Bohemia, California and Oregon. Throughout the brewery the latest improved apparatus is used and everything is run by a forty-five horsepower engine. About 250 cords of wood in a year are burned in keeping the plant going. The water is procured from a driven well at a depth of sixty feet, and tests of it have proven

that it is peculiarly fitted for the manufacture of beer. It is absolutely as pure water as can be found in the country, and its supply is apparently unlimited.

The beer is kept in steel tanks shipped from Detroit. They have a capacity of seventy barrels and are lined inside with enamel. The building throughout is so equipped with radiators that nothing can freeze, and there is little difficulty in keeping the building, winter or summer, at exactly the temperature required.

To handle the large business the company has to keep on hand between 2,500 and 3,000 shipping kegs, and more than fifteen thousand empty bottles are always in process of being refilled.

Until recently there were two breweries in Fairbanks, but the Arctic brewery was absorbed by the Barthel company a couple of months ago. None of the equipment of the purchased brewery has been installed at the Barthel plant, however, as such action has not been necessary. So it is that, in case of enlarged business, the Barthel plant can be so extended at short notice as to be in position to accommodate it.

IMMIGRATION TO ALASKA

WEALTH OF RESOURCES IS NOT ENOUGH TO BUILD AN EMPIRE. PEOPLE MUST BE TOLD ABOUT IT AND HELPED TO COME. A PRACTICAL PLAN PROPOSED BY FALCON JOSLIN, OF FAIRBANKS.



IT IS believed that the coming census will show that the population of Alaska is declining. The country is enormously extensive and rich in mineral and agricultural resources. There has never been an effort made to encourage immigration there.

It is believed that no country, no matter how rich, gains population except by specific effort by way of advertising to encourage immigration.

The Western states have been populated largely by the efforts of the transcontinental railroads. It is believed that the immense immigration, now, and for years past, annually arriving from Europe, is brought to America chiefly by the efforts of the steamship companies.

The Canadian government for some years has been spending approximately \$1,000,000 a year for encouragement of immigration to its Northwest provinces. Canada is gaining about 250,000 immigrants a year at an expense of approximately \$5 per head. One hundred thousand of these are Americans, and it is estimated that each American takes with him \$2,000 in money or property. A simple calculation shows the enormous national profit in dollars and cents as well as inhabitants.

Allaska is believed to be agriculturally as favorable a country to populate as the Canadian Northwest, and in addition, has stores of gold and other minerals which the Canadian provinces have not.

Scandinavia, lying in the same latitudes as Alaska, has a population of upwards of eight million, and an area a little less than half that of Alaska. There are about three hundred miles of railroads in Alaska, while Scandinavia has over ten thousand miles. It therefore would seem that the field for immigration and settlement in Alaska is almost unlimited.

ABSORBING IMMIGRANTS.

The amount of new population which can be absorbed in a given territory is proportioned to the inhabitants already there, and may be for Alaska roughly placed at 10 per cent. A million immigrants are absorbed at New York annually without difficulty, because they can be distributed among eighty millions population. Canada, with a population of six million, readily absorbs 250,000 immigrants per year. It is believed that Alaska, with a population of 50,000, can absorb not to exceed 5,000 per year at present. Each immigrant to Alaska should possess not less than \$500 in money or property, to insure that he will not become a burden rather than a benefit. For this reason care must be taken in the selection of immigrants.

It is proposed therefore to begin a system of advertising for the right kind of immigrants with a view to starting a steady and increasing stream of population toward Alaska. It is expected that for the first year or two not more than one or two thousand can be obtained, but within five

years the immigration should reach five thousand per year and continue increasing.

As to the class of immigrants, it is believed that Scandinavians and other farmers from the Northwest and miners from Colorado and other mining states would be most desirable. Possibly, in time, farmers from the north of Europe can be obtained.

METHODS OF ADVERTISING.

The methods of advertising for immigrants have been thoroughly worked out by the transcontinental railroads and by the Canadian government.

First: By pamphlets and maps descriptive of different localities. These are provided in large quantities to be sent in response to inquiries. The co-operation of the different communities in Alaska can be obtained in this part of the work.

Second: There should be an immigration office in Seattle, which is the starting point and headquarters for all travel to Alaska. This office should be on the street floor and have exhibits of agricultural products, minerals, maps, photographs, etc., and someone in constant attendance to answer any inquiries in person or by mail, and to distribute the pamphlets descriptive of the various localities in Alaska.

Third: As the pamphlets descriptive of the various localities grow stale in a few months, it is excellent to have a monthly magazine devoted to the exploitation of the country. The Southern Pacific railroad established and maintains the Sunset Magazine,

which has a circulation of over one hundred thousand, and is one of the most important factors in the encouragement of immigration to the West. The Alaska-Yukon Magazine, established by Mr. E. S. Harrison at Seattle several years ago, has been doing in a small way and without official or corporate encouragement the same work for Alaska that the Sunset Magazine has been doing for California and the West. The magazine is practically a monthly advertising bulletin and can be made self-supporting.

Fourth: A proper immigration agent to have charge of the office at Seattle is important. He should be a man able to get the co-operation of the communities in Alaska and also the people at Seattle, who will be directly benefited by immigration and upbuilding of the country. It is highly important when immigrants are sent to a particular locality that someone should meet them and assist them in getting located. Personal solicitation and lectures by the immigration agent in small towns and com-

munities will often result in the formation of large immigration parties. The immigration agent, therefore, should be able to travel not only to communities in Alaska, but among the communities in the states.

Fifth: The people of Alaska and the people of Seattle should contribute a portion of the expense of maintaining the immigration office in order to insure friendliness and co-operation. The minimum of expense for the immigration office at Seattle could be estimated as follows:

Salary of immigration agent,	
monthly	\$200.00
Rent	100.00
Office assistance and expenses..	100.00
Advertising and traveling.....	100.00
<hr/>	
Total monthly	\$500.00

STREAM WILL GROW.

The item for advertising and traveling expenses above is far too small, but could be helped out by co-operation with the magazine.

Some advances to this account should also be procurable from the people of Seattle and Alaska. To secure an immigration of five thousand per year a fund of at least \$25,000 annually would be required. Already there are a large number of inquiries being received by the Chamber of Commerce of Seattle, by the newspapers and magazines, and even the postmaster. All of these could be referred to the immigration office and intelligently answered. It is believed that with this small allowance a beginning could be made and a few hundred immigrants procured in the first year, and that as the office becomes established and the magazine circulation increases, and larger funds are obtained for advertising, the stream of immigration to Alaska can be steadily raised until it reaches the limit of the absorptive power of the country.

Careful account of immigrants secured should be kept and reports made annually or oftener.

The FIRE FIGHTERS of FAIRBANKS

IN THREE YEARS THE DEPARTMENT HAS RESPONDED TO 166 ALARMS. DURING THAT TIME THE AVERAGE LOSS PER FIRE TO THE CITY HAS BEEN \$100.



WITH property in the central business district valued by the assessor at considerably more than two and three quarter million dollars, Fairbanks has, during the three years it has maintained a paid fire department, suffered a property loss by fire of \$12,596, or less than one-sixth of one per cent. The cost of the maintenance of the department during that time has amounted to roughly, \$90,000. The running cost for each of the two years prior to the present one was about \$28,000, but the enlargement of the city hall and the installation of the chemical engine have swelled the cost for this year to about \$34,000.

Fires on Garden Island during the three years just past have caused damage to property to the extent of \$17,050; one fire, that at the mill, being responsible for more than two thirds of this amount.

The fire losses during the past year in Fairbanks amount to \$5,495. Included in this amount was one building carrying insurance to the amount of \$2,500, and \$2,350 was collected on the policy.

In the three years the department has responded to 166 alarms, including those on Garden Island and at Graehl. The average property loss for each alarm has amounted to \$178.50. Counting only the alarms from Fairbanks proper it has amounted to about an even hundred dollars.

VERDICT OF GRAND JURY.

Such a showing as is here presented speaks volubly for the efficiency of the fire department when one considers the prone-

ness to bad conflagrations which is the rule in most wooden towns of the size of Fairbanks. In making the final report to Federal Judge Lyons, the grand jury recently discharged had the following to say of the department:

"It is with pleasure that we are able to state to your honor that the fire department of this city seems to be one of thorough organization and excellence of service. The employes are attentive to their duties, respond to their calls promptly and are patriotic in their service. Their work during the long and bitter months of winter is fraught with many hardships and risks, and it is a matter of congratulation to the citizens of Fairbanks that, under the management of Fire Chief Buckley, the destruction of property by fire has been reduced to a minimum. The adverse criticism of this department only tends to make more conspicuous the contrast with the good service these men have rendered to the public, which, in our opinion, justifies this endorsement."

EARLY HISTORY.

At the beginning of the fiscal year of 1909 the fire department consisted of the following members: J. J. Buckley, chief; H. J. Gohres, captain; William Roberts, Adolph Olsen, Jack O'Connor, and H. A. King. Its equipment consisted of one host wagon and team with 5,600 feet of 2½ inch rubber lined hose in service. In August a petition was circulated and signed by nearly all of the business men asking the city council to re-install the chemical in service. This chemical engine cost the city

\$2,400. It was purchased in Chicago in the summer of 1905, and, being shipped late, was frozen in at Nenana in the fall. The city purchased a team and sent it down to the steamer and the engine was hauled to Fairbanks at the city's cost. It is a Champion engine of a capacity of one hundred gallons.

Until May, 1906, this chemical engine was hauled by a team and the hose cart by hand, but after the big fire the council changed the team to the hose cart and the chemical engine was put out of commission, and its running gear changed to a hose wagon. In the winter of 1906 the chemical engine was put in service again, being mounted on runners to be pulled by hand. It was never used, however, and in the following spring, 1907, it was put out of commission entirely, remaining so until last August. At this time the city hall was extended at a cost of \$2,250, and a team for the chemical engine was purchased at a cost of \$650. The citizens of Garden Island helped defray the expenditure by contributing nearly one thousand dollars.

THE VOLUNTEERS.

The first fire department in Fairbanks was a volunteer one organized in the summer of 1903 by the citizens under the direction of Dan Noonan. The equipment consisted of a few buckets, ladders and fire axes and several water holes in the slough which Chief Noonan was expected to keep open. In the fall of 1904 a fire commission was chosen, consisting of Dr. Hall, Charles Beam and J. H. Patten. Fred McCarty was appointed fire chief and under him he had

a volunteer brigade. No record of the names of this brigade is on file.

The city council first took over the fire department in November, 1904, and J. J. Buckley, who at that time was a city patrolman, was elected chief. Mr. Buckley retained his office as patrolman until April, 1905, receiving \$50 per month extra for services performed as fire chief. The personnel of the department in 1904 and 1905 was J. J. Buckley, chief; Jack Bellerby, assistant chief; Jim Duncan, William Stone, William Johnstone, Lloyd Griffith, Adolph Olson and Otis Stone and a few others whose names are forgotten. There was on hand 2,000 feet of hose and one express wagon for a hose cart, which was drawn by hand. For winter use there were two sleds, which also were drawn by hand.

By request of the chief the city council in January, 1905, built a hall 15 by 25 feet, one story, on Second avenue, between Turner and Barnette streets. This was later moved onto Turner street, between Second and Third avenues.

In the summer of 1905 the chemical engine was ordered, as already recounted, and the equipment then consisted of this, one hose wagon hauled by hand, and a team for the chemical, purchased at a cost of \$800. The salaries paid were \$200 for the chief and \$150 each for John Diston and W. H. Johnston, the paid employes. The volunteer members were furnished with a place to sleep and were paid \$1 an hour for attendance at fires.

The loss by fire to the city up to this time was very small, the worst fires occurring in Garfinkle's store, in Switzer's laundry and in the Cascade laundry.

THE NEW FIRE HALL.

In the fall of 1905 the council decided to build a new fire hall on the ground where the present hall now stands, the second floor in the front to be used as a council room, the first floor to be for the chemical and the hose rig. These two rigs were to be single horse rigs, but on their being tried out it was found they were too heavy and both horses were put on the chemical.

On February 19, 1906, the department moved into its present quarters, and at the same time the council provided a mess for the members. Diston and Johnston received \$150 and board, and the volunteers received board and a place to sleep.

On May 22, 1906, the town was visited by the largest fire in its experience. It was after this that the council changed the team from the chemical to the hose wagon, the feeling being that if a team was to be kept it was better to have it on the hose wagon, as this responded to all alarms and, having to be pulled by voluntary assistance on the street, was very slow in getting into action.

On December 17, 1906, the city was again visited by a conflagration that threatened the existence of a large portion of the business district. This fire was controlled by the department with a property loss of \$13,000. It started in the Model cafe and spread to the Owl Drug company's store,

Friedman's, Bloom's stores and the Vienna cafe.

The water system at this time consisted of 1,000 feet of eight-inch mains, all located on Second avenue, except one situated at First and Cushman streets. The service was paid for by public subscription at the rate of \$600 per month, without standing pressure. It was then taken over by the city and paid for out of the city funds.

The city then asked the N. C. company to put in more hydrants, a request the company refused. The city then put in five more hydrants at its own expense, making fifteen in all. These have since been taken over by the N. C. company and a standing pressure is maintained in them at a cost of \$800 per month to the city, the company standing the expense of repair work to the mains.

THE PAID DEPARTMENT.

The department remained without change until after the city election of April, 1907, when a full paid department was installed, consisting of J. J. Buckley, chief; John Diston, captain; H. C. Jackson, Gene Huckins, F. A. Douse and William Roberts.

Members of the paid department who have since retired from the service are E. F. Hein, F. A. Douse, H. C. Jackson, H. A. King, John Diston and Gene Huckins. The oldest member of the department is Adolph Olson, he having joined the volunteer department in 1905 and being employed off and on since that time. He is now a regular member and has been such for some considerable time.

During the period between May 27, 1907, and April 1, 1908, the department responded to forty-two alarms, laying 26,750 feet of hose. The property loss was \$1,120 in the city and \$1,735 on Garden Island. In the following year there were 59 alarms, 34,500 feet of hose laid and the city suffered a property loss of \$5,981, while Graehl was set back just \$300. From April 1, 1909, to the present time there have been 65 alarms, entailing a loss of \$5,496 in Fairbanks and \$15,025 on the island. There were 44,150 feet of hose laid.

THE N. C. BRIGADE.

In the Northern Commercial company's fire department the regular brigade has a most capable ally and one that is of inestimable benefit to the city. This company's avowed purpose is to act as an auxiliary to the regular department and to be present at those fires at which it can be of practical use. At cabin fires in the outlying districts it is not necessary for it to turn out, as the paid department has reached such a state of efficiency as to render it more liable to hinder than to help. Whenever, however, there is a fire in the business district the N. C. brigade is ready to turn out and place itself under the orders of Chief Buckley of the regular department.

The volunteer company has also proved of great assistance to the regulars at such times when the fire has been beyond the reach of the regular department's hose. Then it is that the N. C. hose, amounting to two thousand

feet, is attached to the city's hose and the fire-fighters are enabled to reach a vantage point unattainable with their own hose.

The N. C. fire brigade was established in 1904. It consisted at that time, as it does now, of all the employes of the company. The active fire fighting staff, at this time, consists of a chief, a chief engineer, an assistant engineer, an electrician and seventeen men. It is always on duty. No matter what the time of the night, or what they might be doing at the time, the men respond to every alarm and seek their stations as conscientiously as do the members of the paid brigade. A few years ago, when Bill McPhee's place burned, several of the members, togged out in evening clothes, appeared on the scene hauling the hose sleds. They had been at a dance when the whistle interrupted them.

The active fighters are equipped with full firemen's rig in the way of clothes and each has had a certain amount of training to fit him for his especial station. A pole from the dormitory leads to the power house, and down this the men slide the moment the alarm is turned in. The alarm also automatically unlocks the door to the hose department and the turnout is made in an incredibly short time.

In the winter there are two sleds for use, each carrying one thousand feet of hose. In the summer two hose reel carts are used, each carrying 500 feet, and a fire wagon with 1,000 feet. There are also six ladders in the department's paraphernalia, with a sled for these built especially for the purpose. Patent cut-off nozzles are included in the equipment, besides axes and all the other necessary apparatus.

As soon as an alarm is received for any fire, the engineer, Joe Mathews, and his assistant, John Jacobson, proceed to the power house and stay there until the fire is out. They devote their entire attention to the pumps, oiling them when necessary and keeping the machinery in working order. Their work is entirely auxiliary to that of the regular engineers at the plant. The electrician, Terence Foley, goes to the scene of the fire to be ready to cut wires or do anything else in his particular line that the exigencies of the occasion demand. This is in the case of all fires, not only those at which the N. C. brigade turns out.

Bob Menzies is the present chief of the brigade and he has held that position for nearly three years. He has taken a great interest in the work and is as enthusiastic a fire-fighter as any of the members of the regular brigade.

On top of the power house a giant monitor has been installed, which is capable of throwing a two-inch stream for a distance of 175 feet in any direction. It works on a ball and socket bearing and can be raised or lowered as occasion requires. It would throw a stream on to the Fairbanks building, the Red Cross drug store or the city hall.

With these means and men at hand, it is no wonder that the agent of the Underwriters' association who was here last summer said that he did not know of a city in the world, of anything like its size, that was so well equipped for fire fighting as was Fairbanks.



Transportation In the Tanana Valley

TWO STEAMBOAT LINES, ONE RAILROAD, AND STAGE LINES, HANDLE THE FREIGHT AND PASSENGER TRAFFIC.

In all the latter-day Industrial World fairs, they have erected a temple to Transportation. Transportation is the controlling factor in the industrial development of Alaska today. It is not climatic conditions; the climate is not equaled in many parts of the world. It is not barrenness of soil; the land is rich in natural resources, and offers a vast field for profitable farming. It is transportation that is calculated as the first item in all industrial operations, and that must be depended upon to extend the development of the land back from the main river channels in the Interior. The Tanana valley is provided with forty-five miles of railway; two important lines of river steamers, besides a number of independent boats; and for the winter time, one, and at times two, stage lines to Valdez, the winter port on the south coast. The most daring project in the interior of Alaska was the building of the Tanana Valley railroad.

The Tanana Valley Railroad

This railroad is in theory a part of a great trunk line that is projected from Puget sound to Alaska, and to traverse the entire length of the Territory to Bering strait. The trunk line on the map is 1,400 miles long. The Tanana Valley road, as before stated, extends a distance of forty-five miles; the greater part of it at right angles to this trunk line, between Fairbanks

and Chena, on the south, and Chatanika on the north, on the way to Circle City on the Yukon river. It covers the richest sections of the Tanana gold hills.

EXPENSIVE BUILDING.

Twenty-five miles of this road was built in the year 1905, connecting Fairbanks and Chena, and these two with Gilmore and Pedro creek. In the summer of 1907 the road was extended across the hills to Chatanika. The road has been in operation since September, 1905. Winter does not offer more obstacles to the operation of the road than

it does to a railroad in the states, and the trains are rarely interrupted by blizzards.

The building of the original line was very expensive. The work was done in two working seasons of about six months each. Wages for common labor were \$7.50 a day. The freight charges on the rails were more than twice the cost of the rails in the states. The rates ranged from three to six cents a pound on all kinds of equipment, including locomotives.

FUEL IN ABUNDANCE.

When the railway came into the trans-



TANANA VALLEY RAILROAD DEPOT AT FAIRBANKS.

portation field, the cost of hauling over the roads from the towns on the rivers to the mining creeks was \$3.00 per ton per mile. The average freight rate per ton per mile on the railroad is \$.58. It is estimated from these figures that the railway has saved the people along the line more than \$300,000 each year in freights alone. The latest published figures show that the road carries an average of over 50,000 passengers and about 15,000 tons of freight a year. The operating expense is about sixty-two per cent. of the gross earnings; but interest charges are a heavy burden on the remainder.

One of the heaviest items in the operation of the road is the wood bill for fuel wood. This costs \$9.00 a cord, piled along the track. As the wood nearest the track is becoming depleted, the price is bound

the continent, or six weeks by way of Panama, and freight came ten thousand miles around the Horn, there was one universal demand from which there was no dissent. That was for a railroad across the continent. For ten years every legislature and every civic body in California unceasingly hammered at congress to aid the vast project for a transcontinental railroad, that they might be brought closer to the rest of the nation and their state be bound closer to her sister states. The subsidizing of the Union Pacific and Central Pacific railroads, and their triumphant completion as a through line, was largely the result of the persistent demand of the people of California."

In the same way the people of Alaska, and especially of the Tanana valley, are now

The N. N. Company

The Northern Navigation company's fleet consists of thirty-two river steamers, with a total tonnage of 17,000, and thirty-five barges, with a tonnage of 10,000, also numerous tow-boats and other harbor craft for service at St. Michael.

The river steamers are all stern-wheelers, but present many variations from the great Mississippi packets, which make regular trips up and down the Yukon between St. Michael and Dawson, to the small, extremely light draft steamers which have recently been constructed for special service on shallow streams, when the water falls low late in the season. A short description of these



VALDEZ, THE WINTER PORT OF FAIRBANKS.

to increase rapidly, and the company must look to other means for developing locomotive energy. To this end, Mr. Falcon Joslin, president of the road, has ordered a number of electric coaches for passenger traffic, and these will arrive during the coming summer. Sixty miles south of Fairbanks and beyond lie the largest coal fields in the entire world. They contain soft coal of a kind that would be suitable for use on railway locomotives; but at the present time they are locked up while the nation is discussing conservation, and inasmuch as the world must move, it is necessary to devise fuel to keep it moving.

GOVERNMENT AID.

"In California in the early days," says Mr. Joslin in the Alaska-Yukon magazine, "when it took nearly three months to cross

getting together to press their claims for attention from the federal government. Railroads from the coast to the interior are bound to come in time, but the government would be fully warranted by precedent and reason to extend assistance to hasten the time. The old-style subsidies are no longer acceptable to the people; but a system of guaranteeing the interest on the cost of construction by private companies and retaining a lien for any payments which might be made is a system which has been adopted with success in the Philippine islands, and which is financially conservative and sound. During the year 1909, the total import trade of Alaska amounted to \$23,552,764. The export trade amounted to \$36,767,022. They are figures of sufficient dignity to attract attention; but are only an earnest of what the territory might do with a little intelligent encouragement from the government.

two types fill not be out of place.

The Mississippi packets, Susie, Sarah, and Hannah were built in 1898. Their dimensions are: Length, 223 feet, breadth, 42 feet, and depth 6 feet 2 inches; their tonnage is 1211, and their speed about fifteen miles per hour, which enables them to stem the swift Yukon currents without difficulty. These boats represent the very highest development of their class. They are supplied with electric lights and cold storage-plants; the staterooms are large and well ventilated; the table offers an abundance of well-cooked food of excellent quality, and the service is efficient and courteous. The masters, pilots and engineers have been long in the company's service and are chosen for reliability and experience.

Until 1903, wood was used for fuel exclusively. In that year the company, in

pursuance of its policy of adopting the most modern methods, introduced California crude oil as fuel, and, at heavy expense, large storage tanks were erected at various points along the Yukon, and the necessary apparatus installed on the steamers. Absence of dirt and cinders, elimination of tedious delays to "wood up," and increased steaming capacity of the boats, all result from this improvement. Fifty thousand barrels of this fuel are used annually.

After the packets comes a long list of river boats of many types, for every branch of the service. There are tow-boats and tenders, powerful freighters and many fine passenger boats, all well equipped with the company's high standard of excellence.

Last in point of size, but of great importance to the public, are the newly constructed light-draft boats Tanana, Koyukuk, Delta and Reliance, for use exclusively on the shallow streams tributary to the Yukon, which are now much in the public eye on account of rich placer finds in their vicinity. These streams, fed by the melting of the winter snow, diminish greatly in volume toward the end of summer and their navigation by the heavy Yukon steamers is impossible. It is then that the usefulness of the little boats is demonstrated. Drawing but a few inches of water, they make trip after trip with such regularity that residents of the remoter camps, high up on the Tanana and Koyukuk rivers, have come to regard them as indispensable.

The N. A. T. & T. Co.

The North American Transportation & Trading company's fleet consists of eleven river steamers, with a total tonnage of 10,000, and twelve barges, with a tonnage in proportion, as well as harbor-craft at St. Michael. The steamers are modern in every respect, fitted with electric light, steam heat, hot and cold water in the staterooms, and other comforts that might naturally not be expected under the Arctic circle.

The steamers are officered by men of long experience, men from the Columbia and Mississippi rivers, and every attention is given to the comfort and safety of passengers. The largest, finest and most modern seamer on the Yukon, the "Will H. Isom," belongs to the N. A. T. & T. company fleet. Her capacity with barges is 2,500 tons. The steamboats of this line make regular sailings from St. Michael weekly during the season of navigation for all Yukon and Tanana river points.

The North American Transportation & Trading company constitute the pioneer merchants and carriers of Alaska.

The Orr Stage Co.

Alaska is not, as many people may suppose, accessible only during the summer season, and entirely inaccessible during the winter. True, some parts of Alaska, owing to the immense extent of the territory and the great difference in climatic conditions, cannot be reached, or at least are not reach-

ed, during the winter season by the ordinary means of transportation, but the great sweep of coast territory, extending from Ketchikan in Southeastern Alaska to Dutch Harbor and Unalaska at the extremity of the Alaska peninsula and the entrance to Bering sea, is served regularly throughout the entire year by steamers, and from Valdez in Southwestern Alaska and from Skagway in Southeastern Alaska, stage lines are operated, reaching Fairbanks and Dawson, the principal cities of the American and Canadian Yukon districts.

From Valdez the government has constructed and maintains a road across the coast range of mountains into the interior of Alaska—the valley of the great Yukon and its tributaries—over which stages carry U. S. mail and passengers, operate during the winter season on regular schedules between Valdez and Fairbanks. These stages are operated by Ed. S. Orr & Co., in close connection with the steamers sailing from Seattle for Valdez. Stages are also operated between Fairbanks and Fort Gibbon (also named Tanana) at the confluence of the Tanana and Yukon rivers. From Fort Gibbon (or Tanana) mail is carried by dog teams down the Yukon and across country to St. Michael and Nome.

During the past two years the Alaska Road commission has expended near the sum of \$100,000 in improving the conditions of the Valdez-Fairbanks trail, which, together with the much improved roadhouse service from year to year, renders the trip overland one of pleasure rather than hardship. The U. S. mails for Fairbanks and Nome, and, in fact, the whole of the interior of Alaska, are now sent over the Valdez



STAGES LEAVING VALDEZ FOR THE INTERIOR.

route during the winter season. Until last winter there had been a twice-a-week mail service between Valdez and Fairbanks, under contract with the Northern Commercial Co., which contract has recently been increased by an additional amount of 48,000 pounds of mail matter, which necessitates a tri-weekly service during the present winter, beginning about the 24th of November.

In connection with this mail service, Ed. S. Orr & Co. maintain a fully equipped stage line for the accommodation of express and passengers. This is the fourth season of the Orr stage service. The stages connect with the steamers of the Alaska Steamship company at Valdez, making the trip from Valdez to Fairbanks in about eight days. Comfortable roadhouses are located about every twenty miles along the route, where horses are relayed, and meals and sleeping accom-

modations may be secured by travelers. There are a number of U. S. telegraph stations located along the trail, thus making it possible for patrons of the line to keep fully informed in regard to current events, either in Alaska or the outside world. The stages operated on this route have accommodations for nine passengers and the driver, and are the wide-bed, upholstered bobsled, well known to the upper Yukon travelers.



THE WATERFRONT AT FAIRBANKS.

LIGHT, HEAT *and* WATER

FAIRBANKS IS AS WELL SUPPLIED WITH ALL THESE MODERN CONVENIENCES AS IS ANY CITY
OF THE FIRST CLASS.

The N. C. Plant



WHILE familiarity does not always breed contempt, there is no question but that it generally has a tendency to beget indifference and to cause us to soon accept as a matter of course and consider as necessities the various improvements

in our scale of living that were at first looked upon as novelties and luxuries. In the short span of six years the town of Fairbanks has emerged from a lonely unidentified spot in the wilderness, with nothing to distinguish it from any other spot in the vast, unexplored interior, to a community enjoying metropolitan comforts, conveniences and luxuries equal to those of a city of three times its size in the States. Yet it is doubtful if the pioneer who pitched his tent on the banks of the Tanana in 1904, cleared a place among the trees and underbrush of the primeval forest for his humble cabin, and depended upon the constant stoking of his smoky little sheetiron stove with green wood to keep his teeth from chattering while he read his semi-occasional letters from home by the flickering light of a tallow candle, ever gives more than a casual thought to the excellent steam-heating and electric lighting service which he now has at his command; to the more than excellent stage

service that brings three times a week not only his letters but his magazines, papers and express; to the incomparable telephone service that enables him to sit in his office or his home and transact in a few minutes business that in the old days would have taken a week or more of weary musing to accomplish; to the railroad and automobiles which carry him with speed and comfort to the outlying districts where business may require his presence; or to the efficient and well-equipped fire department and the water mains with the big, pulsing, throbbing pumps keeping up a constant pressure and prepared for all emergencies, which permit him to go to his rest with the peaceful assurance that his property will be protected.

In view of this peculiar trait of human nature, and while reviewing the various industries of the Tanana Valley, it will be interesting to consider the concerns which furnish us such domestic necessities as electric light, steam heat and water.

ELABORATE PRECAUTIONS.

The big plant of the Northern Commercial company, at the corner of Second avenue and Turner street, is not only the first, in point of time, of our city enterprises, having been established in 1904, but without a doubt represents the largest initial investment and the greatest cost of maintenance—which incidentally means the largest pay-roll and

the greatest circulator of money for fuel and other purposes. In addition, it has probably contributed more than any other single enterprise to the comfort and convenience of our citizens and to the protection of our property; as to the almost universal use of steam-heat and electric lights in the business section of the town, and consequent elimination of stoves and oil lamps which this has made possible, the remarkable infrequency of fires in that portion of our community is largely due.

This plant consists of six boilers aggregating 600 horsepower, all set in separate settings so that any of them may be disconnected without disturbing the others or interrupting the service. Each boiler has two main steam connections with the power house—one connecting into the main steam line and the other into an emergency auxiliary line, providing two ways, each independent of the other, by which steam can be conveyed to each engine and to the big fire pumps, and thus safeguarding the service from interruption in the event of an accident happening to one of the steam connections.

Upon the proper working of this plant depends the very life of the town—the protection of our buildings and the preservation of our winter supply of food and clothing. Therefore, every precaution that human ingenuity is devised is used to prevent accidents to the plant and to provide for

emergencies in the event that accidents should occur.

HUGE WOOD SUPPLY.

All the boilers, engines and pumps are set upon independent foundations of concrete, and the steam connections from the boilers to the engines and pumps are free from any connection with the building. In case of a general conflagration the power house itself could burn to the ground, but the firemen, at the latest moment consistent with the safety of their lives, would fill up the great furnaces, regulate the drafts, and the big pumps would pound away for hours delivering tons upon tons of water for the use of the fire department, and would continue operating for a length of time sufficient to allow the ashes of the power house to be cooled so that the stoking of the furnaces could be resumed.

The fire pumps are two in number and each has two steam cylinders 17 inches in diameter and with a 17-inch stroke, and a capacity of 2,200 gallons of water per minute under a 300-foot head. They are of the ram pattern and made by the Henry R. Worthington company, of New York. When working at full capacity they can deliver at a distance of one-half mile nine tons of water per minute, or 540 tons per hour.

The fire mains parallel the steam-heat mains and are thus kept from freezing even during the coldest weather.

The domestic water service also parallels the steam mains and in some instances goes for a considerable distance beyond the steam pipes. On First avenue, water has been delivered to private houses at a distance of 2,500 feet beyond the steam mains, and the pipes are so protected that the coldest weather has not interrupted the service. The pump which supplies the domestic service is a compound duplex Worthington piston pattern, with a capacity of 750 gallons per minute, and can be connected into the fire mains in an emergency. A constant pressure of 100 pounds is maintained by an automatic governor which regulates so closely that the pressure on the mains will not vary five pounds in twenty-four hours, no matter how much or how little water is being consumed.

This domestic pump is installed in a house separated from the other pumps and on the opposite side of the street, and is fed by two steam connections, each independent of the other, one being overhead and the other underground. This pump can supply three 2½-inch hose lines and would be very effective in extinguishing any fire that might start in the power house.

Water is supplied to the boilers by automatic feed regulators which start to operate the moment the water falls to a certain level, and thus eliminates the danger of explosion by reason of the boilers going dry.

In fact, the whole scheme of the fire fighting apparatus is so perfectly arranged that it is difficult to conceive of any combination of circumstances that could put it out of commission, and the water supply is the whole Chena river, and is inexhaustible.

STEAM HEAT.

The fuel supply for the plant is a very important consideration and the same ex-

traordinary precautions that surround the other details of the service are extended to this feature. A reserve supply of 50 cords is constantly kept in the power house to be used only in case of emergency. This quantity is sufficient to keep all the furnaces going under forced draught and to maintain the fire pumps at full capacity during the continuance of most any large fire that could occur. In addition to this supply a number of teams are continually bringing in wood and piling it on a long string of flat cars in the yard. This wood constitutes the ordinary daily supply and the cars are hauled into the power house as needed. An emergency yard on Third avenue contains an additional supply for use in case of an unusual demand, and several thousand cords are always kept on hand at the main yard at the end of Barnette street, which is connected with the power house by a track over which the wood is hauled in flat cars.

ELECTRIC LIGHT.

The steam-heat mains extend 2,500 feet each way from the power house, and the



A CLEAN-UP.

main lines, with all branch lines, returns and auxiliary connections from carb lines to power house, consist of 125,000 feet of pipe. This line has been in successful operation for the past five years, and during the most severe weather, without an interruption of more than two and one-half hours for the entire period. The total amount of pipe through which heat is circulated from the main lines is approximately 150,000 feet, which, added to the main lines, makes a quarter of a million feet of pipe through which circulation is maintained constantly and without interruption, even when the weather is 65 degrees below zero.

The light plant has a capacity of 9000 16-candlepower lights, and is so arranged that there are always two idle machines

which can be put into service in five minutes in case any of the other machines are disabled.

The system of distribution is the Edison three-wire system and is carried to all parts of the city, and consists of 33 miles of pole line. During the past five years the longest interruption of the service at any one time was 10½ minutes, and the aggregate of all the interruptions during the past five years amounts to only 1½ hours. A remarkable record when it is considered that during the winter months a constant twenty-four-hour service is required.

During the last season a complete set of General Electric company voltage regulators was installed at an expense of \$2,500, to maintain a constant and steady voltage on all the lines in the company's service. The advent of the tungsten lamps required this, as they are very delicate and easily broken, and the large power houses in the States have discovered that one of the greatest sources of breakage is the fluctuating voltage that always attends hand-regulation. These regulators are beautiful pieces of mechanism and as complicated and delicate as a set of wireless telegraph instruments. They can be seen in operation at the power house any evening after the lights are turned on.

The company has enlarged its plant from time to time as the demands for its service grew with the development of the camp, and has kept abreast of the times and given the people of the North the benefit of all the modern improvements in this line that are enjoyed by the people of the States.

The Independent Plant

The Independent Light & Heat company has been in operation for about eighteen months. Its present capacity is not merely sufficient for the business offered and it will be very materially augmented this summer. It has grown in the course of fifteen months from a business of 300 lights till now it supplies 1,500, besides furnishing the power whereby many motors are driven. The company also supplies a great many of the city restaurants, business houses and homes with the purest drinking water.

The company has in use at the present time about 40,000 feet of steam piping, 3,000 feet of water mains and 16 miles of wire. The well from which its water is derived is a driven one, 65 feet deep. A flowing well will be sunk this summer from which an unlimited supply of water will be procurable.

The plant is operated with two sets of McEwen engines connected to Thomson-Ryan dynamos to match those already in use. These, with another 20,000 feet of steam piping, will be installed as early as possible after navigation opens.

The majority of the lights used by this company are tungstens, and they have been found to give universal satisfaction. The company's premises are of such a size that extensions to the plant can be made without further building being necessary.

Outline of the Placer Mining Industry

LIST OF THE PLACER CLAIMS ON THE PRINCIPAL PRODUCING CREEKS IN THE FAIRBANKS MINING DISTRICT. OWNERS OF THE CLAIMS AND THE LAYMEN WHO OPERATE THE GROUND.

The following list of the placer mining claims in the Fairbanks district, with the names of the owners and the laymen, is the only list approaching completeness that has ever been published. Absolute accuracy and completeness can hardly be attained, because of the changes of ownership and operation that are going on from time to time.

CLEARY CREEK.

No. 10 above—Thompson, owner; operating self.

No. 9 above—A. Runkel, owner; operating self.

No. 8 above—Sam Hagan, owner; Raymond & Co., laymen.

No. 5 above, upper half—Peterson & Nelson, owners; Bostrom & Co., laymen.

No. 5 above, lower half—Hamil & Co., owners; Willett, layman.

No. 5 above, creek—John Bechtol, owner; Wahlgren & Morrison, Hendrickson & Co., Newman & Co., laymen.

No. 4 above—Wahlgren & Morrison, owners. Steele & Co., laymen.

No. 3 above—Geo. Moor, owner; McIntosh & Co., laymen.

No. 1 above—Reagh, et al., owners; Nelson & Herington, Cassel & Co., laymen.

No. 2 below—L. C. Hess, owner; Davidson, layman.

No. 2 below—L. C. Hess, owner; Johnson & Cooper, laymen.

No. 2 creek—Bleecker & Co., owners; windlass lay.

Hilty fraction—Hilty et al., owners; Smith, layman.

Freeman bench—C. Dittmer, Michie et al., owners; Foster & Hungerford, laymen.

Freeman bench—C. Dittmer, Michie et al., owners; Larson & Co., laymen.

No. 3 below—Couture, owner; operating self.

No. 3 below—Couture, owner; Cosslett, Schulz & Co., laymen.

No. 3 creek—R. Cunningham, owner; operating self.

No. 3 creek—R. Cunningham, owner; Gartley & Co., laymen.

No. 4 below—Boone et al., owners; operating self.

No. 4 below—Boone et al., owners; operating self.

No. 4 below—Boone et al., owners; Altman and Benbrook, laymen.

No. 4 below—Boone et al., owners; Pearson, Johnson & Michie, laymen.

No. 5 below—Manley et al., owners; Bulard & Aitken, Riley & Aitken, Smith & Co., Riley & Aitken, laymen.

No. 6 below—Wilson & Michie, owners; no lay.

No. 9 below—Hamilton & Drennan, owners; operating self.

No. 10 below—Gaustadt & Co., owners.

Tillicum Co., Hendrickson & Gord, Gatz & Bjorstrom, laymen.

No. 11 below fraction— ——— Swedish Mining Co., laymen.

No. 11—Riley & Aitken, owners; Powell & Co., laymen.

No. 12 creek— ——— Anderson & Co., laymen.

No. 12—Cascaden, owner; Johansen & Co., laymen.

Becker fraction—Becker, owner; Anderson & Co., laymen.

No. 13 creek—Lawson, Walters & Wissell, owners; operating self.

No. 14 bench—Underwood & Noyes, owners; Peterson & McBride, laymen.

No. 14 below fraction—W. J. Nolan, owner; Keys & Rettig, laymen.

No. 14 below, creek—Noyes & Underwood, owners; David Luke, O'Brian & Co., Johnson & Anderson, laymen.

No. 15 creek—Lawson & Walters, owners; operating self.

No. 15 fraction—Hans Hess, owner; operating self.

No. 15 below, second tier—Gust. Vedin, owner; operating self.

No. 15 below, first tier—Gust. Vedin, owner; Tom Pearson, Sutter & Co., laymen.

No. 15 below, first tier, upper half—W. J. Nolan, owner; Keys & Rettig, Scaia & Co., laymen.

No. 16 below, first tier—Hastings & Roth, owners; Sam Lind, layman.

CHATANIKA.

No. 1 below—Meyerhofer & Co., owners. operating self.

No. 1 below—Meyerhofer & Co., owners; Union Mining company, laymen.

No. 18 below—Webster & Howell, owners; Watson & Co., laymen.

No. 17—Sam Weiss and Flygar, owners; Sam Weiss, layman.

GOLDSTREAM.

Discovery—R. Staples, owner.

No. 1 below—A. Berg, A. Anderson, owners; Johnson, Swanson & Co., laymen.

No. 1 below, lower half—Lilje & Co., owners; Watka & Co., laymen.

No. 1 below, lower 200 feet—R. Staples, owner; operating self.

Fraction between Nos. 1 and 2—R. Staples, owner; Beeber & Co., laymen.

No. 1 below, creek—Ed Quinn, owner—Lee & Co., laymen.

No. 2 below—Gardner & Co., owners; Finnegan & Bergman, laymen.

No. 3 below, upper half—P. Mogan, owner; operating self.

No. 3 below, lower half—Dunlap & Forcelyn, owners; Brown, Roberts & Forcelyn, laymen.

No. 4 below—Clark Bros., owners; Goine,

Lee & Co., laymen.

No. 4 below, lower half—C. Williams, owner; operating self.

No. 5 below—E. W. Bleecker, owner; Bleecker & Barnes, laymen.

No. 7 below to No. 15 below—Incomplete.

No. 15 below, first tier—Voegtlin & Aubert, owners.

No. 15 below, second tier—Voegtlin & Aubert, owners.

No. 16 below, first tier—Voegtlin & Aubert, owners; Mahoney & McDonald, Malone & Kelly, Pfister & Co., Sasalegno & Co., Torgersen, Shelley & Co., Qualley & Ness, laymen.

No. 17 below—B. T. James, H. H. McDonald, owners; Lamontagne & Co., laymen.

Washington Association—J. Raap, M. Harrais, J. Zimmerman, L. Anderson, owners; Macintosh & Leaf, laymen.

California Association—E. A. Williams, A. Evermann, E. R. Peoples, Val Diebold, J. Beatty, owners.

Duffy bench—Matt Duffy, owner; no lays.

Moriarty bench—Not producing.

Morrison bench, No. 21, second tier—J. W. Hill, owner; Hussey & Co., laymen.

No. 21, first tier—Shepard Bros., owners. operating self.

ENGINEER CREEK.

Owl Association—Dora Williams, E. A. Williams and H. H. McDonald, owners; Dunn & Co., O'Shea & Cook, McGilvray & Enstrom, Peterson & Co., Benson Bros., Lushbaugh, Sam Hagan, laymen.

Wild Goose Association—M. E. Stevens, A. Morency, G. Harrington, R. Geis, P. Pederson, W & J. Johnson, owners; Cascaden & Jamieson, J. Lemieux, Porter & Osborne, Tony McDonald, laymen.

Engineer bench—T. Aitken, A. Everman and A. H. Willmore, owners, Cunningham & Co., Miller & Ness, Whitman & Murray, Styles & Co., laymen.

Phillips fraction—C. Phillips, N. Dan and Steve Lilibovich, owners; Enstrom Bros., laymen.

Discovery—Calder, owner; Ellsworth & Co., laymen.

No. 1 above— ———; Sala & Cullen, Stolcis, Pertile & Co., laymen.

No. 1 below—Burns, owner.

Corning bench—Turner Bros., F. Acheson & Co., F. Corning, owners.

Acheson bench—Turner Bros., F. Acheson and F. Corning, owners.

O. K. Association—A. Morency, G. Herington, R. Geis, M. E. Stevens J. Lemieux et al owners; T Moore, Patterson & Co., laymen.

ESTER CREEK.

No. 7 below—Berry & Hamil, owners; no lays.

No. 6 below—J. Bigelow, owner; no lays.

No. 5 below, lower half—Beam & Mellroy, owners; Chamberlain & Co., laymen.

No. 5 below, upper half—Sam Carruthers, owner.

No. 4 below—Frank Berry, owner; Bob Edgar, layman.

No. 4 below— —; Everall & Bloom, laymen.

No. 3 below—Jesson Bros., owners; Jesson & Conradt, laymen.

No. 2 below—Mihalcik, Berry & Eglar, owners; Strandberg Bros., laymen.

No. 1 below—Jones & McQuarrie, owners. Discovery—Jones & McQuarrie, owners.

No. 1 above—George Haskins, owner; Chisholm & Webster, laymen.

No. 2 above—Belsea & Bardsley, owners; Winell & Finn, laymen.

TREASURE CREEK.

Victoria Association—F. Slade, F. Martin, W. Craig, A. Beatty, H. Boland, C. Hamilton, A. Dougherty, T. Carroll, owners; J. Skeegy & Co., laymen.

Tonaskate Association — Frank Costa, owner; no lays.

No. 6 above—Macgowan & Sears, owners.

READY BULLION CREEK.

No. 1—Luther C. Hess, owner; Morley & Co., laymen.

No. 2—Emil Furstenuau, owner; Ready Bullion Mining Co., laymen.

No. 3—Jones & McQuarrie, owners; Badouin & Lind, laymen.

No. 4 below—J. Mihalcik, owner; Sandstrom Bros., laymen.

WILD CAT CREEK.

Finlayson Fraction—K. Finlayson, owner.

VAULT CREEK.

Hard Luck Association—Craig, Hamilton & Beatty, owners; Martin & Co., laymen.

Victor Association—T. Carroll, T. Cale, T. Crowley, J. Warren, D. Mears, J. Verneti, A. Dougherty, E. Gaglione, owners; no lays working.

Isabelle Association—E. T. Barnette, A. H. Dougherty and T. Carroll, owners; Conta & Peterson, Dominick & Co., laymen.

Oregon Association—Hall vs. McKinnon; appeal pending.

California Association—T. Crowley, T. Cale, T. Carroll, J. Warren, J. Mears, E. Gaglione, J. Verneti, W. Craig, owners; Kelly & Bishoprick, laymen; litigation.

Sierra Association—M. Morino, O. Gatty,

5. Gaglione, P. Whitte, S. Albasini, Conta Bros., N. Delnataro, owners; M. Morino, layman.

Alabama Association—Max Manger, owner; Conta Bros., Stone & Brandt, laymen.

LITTLE ELDORADO CREEK.

Idaho Association—Burns Bros., owners; Glazier, Crockett & Co., Larson Bros., Fitzgerald & McNamara; Hamilton, Pickle & Co., Lennon, Larson & Burns, laymen.

Golden Association—Goldstake Mining Co., owners. Townsend & Smith, Gus Peterson, Theo Witte, Siebe & Widman, laymen.

Eldorado Association—Hess, Hastings & Witte, owners; Huddleston Bros., laymen.

BIG ELDORADO CREEK.

No. 4 above—Otto Kroehle, owner; operating self.

No. 3 above — Kroehle et al., owners; Blanchard & Martin, Nash & Olsen, laymen.

No. 2 above—Blakely & Nevius, owners. Johnson, Blakely & Clapp, McMahon & Zuber, laymen.

No. 5 below—Young & Elliott, owners; operating self.

No. 7 below—Smith & Hess, owners; Sandow & Co., laymen.





LAND FRAUDS IN ALASKA



HOW A PERNICIOUS LAW IS PERMITTING THE BEST GOLD-BEARING LANDS IN THE TERRITORY TO BE GOBBLED BY COMPARATIVELY FEW PERSONS. *By HENRY RODEN.*



WHEN in the year 1867 Secretary Seward bought his now famous "ice-chest" for the American people, there were few who believed that Uncle Sam would ever receive back the purchase price paid therefor, and fewer still entertained any hope of ever seeing

"that barren land of ice and snow" take a prominent part, not only in the affairs of the American people, but in the business of the world.

In the short span of forty years Alaska has paid back the seven million two hundred thousand dollars originally paid for it, many times over, together with interest at a very handsome rate and a large bonus in addition.

The importance of Alaska as a mineral producer has been recognized, and is being appreciated by those who have spent a lifetime in the big mining centers of the United States and other countries. Properties are changing hands involving the expenditure of large amounts of money in every part of Alaska, and the press of the various sections is constantly informing its readers of new strikes, discoveries and enterprises.

But with the opening up and development of the land, the social, commercial and political conditions of its inhabitants are rapidly changing. The day is not far distant when the hard and fast rules of the outside world will have made their appearance among the rank and file of Alaska's people: when the opportunities for individual advancement will be lessened and circumscribed; when every man will be at the throat of every other man and when the competition and deadly struggle for existence so prevalent in outside communities, and to escape which most of us came to Alaska, will have established its firm hold upon the people of the North and bar all but the exceptionally fortunate or gifted from achieving success in a land where everybody should succeed in obtaining what we are prone to call a life competency.

When the days of rocking with a long-tom or other similar machine on the Forty-mile or other well-known rivers shall be forgotten; when the windlass shall have fallen into the shaft and sluice-boxes have become moss-covered and rotten; when in the place of the hoarse "hoist" shall be heard the shrill shriek of the siren whistle and when "Jimmy Armstrong at the windlass" will have been replaced by modern steel contrivances and when the numberless small corporations, now making their appearance in all sections of the land, shall have become amalgamated into one giant concern which shall be the only operator

in the wide valleys of the country, and when we, of the days of the pick and shovel, grown a little older, shall see the ground which we expected our sons to open up and mine, taken up and gathered in—by whom? By those who never saw Alaska; by a Guggenheim, or some other gobbleheimer by means of men ever ready and even anxious to use their father's name for a mess of pottage, and for such mess of pottage, shall have turned over the same to them.

Such is the tendency of the tide that set in some four or five years ago and all that is required for it to engulf the entire country into the mining camp where but one paymaster shall be known is to allow it to have its course a few years longer.

THE "GOBBLEHEIMERS."

The opportunities of the independent prospector to take his kit and blankets and start forth into the field to see what fortune has in store for him has already been reduced to a minimum, and within a short while, for all practical purposes, have come to an end. Already the man who wants to prospect is forced to make long trips in order to reach a section of the country where the ubiquitous "dredging and hydraulic agent" has not left his mark.

Loaded to the guards with lists of names furnished him by his gobbleheimer employer, the "dredging and hydraulic agent" starts forth into whatever direction his enterprising spirit may guide him, with his blankets and provisions on a mule or two. Landed where nobody has yet used the hatchet, he begins to plant stake after stake, from early morning until late into the summer night, endorsing thereupon the names of persons, furnished him by his employer, of whose existence he knows nothing. And all this for a trifling amount of cash; a little grub and perhaps a small interest in one of the many association claims in the location of which the employer allowed him to use his own name.

A few thousand acres having thus been severed from the public domain for the benefit of one or two greedy individuals, what is the next step in this shameful proceeding to defraud the government and gobble up entire sections of valuable mining ground?

The locations are duly recorded and, as no annual labor is to be performed until the end of the following year, the ground lies idle. When the time for representation comes around the unprincipled locator, urged by his equally unprincipled employer, goes back to the ground, for the first time since he located it, scratches the soil here and there, and makes a change or two in the names which he endorsed upon his stakes, or, if such prove absolutely impossible, owing to the watchfulness of genuine prospectors, ways and means are found that allow the doing of something that will pass for representation work; and though

such actions and proceedings show upon their face the fraudulent intent of the parties practicing it, who has the courage to institute legal proceedings for the annulment of the location?

CROWDING OUT THE PROSPECTOR.

Thus, after a discovery has been sworn to, the ground lies idle for a couple of years—a thorn in the flesh of the honest prospector in search for a little piece of unappropriated land whereupon he may pitch his tent and sink a shaft.

The next thing that usually occurs in such cases is for the promoter to explain, to those who may become inquisitive, how difficult it is to get Outside capital interested in this northern country and that the following summer, no doubt, all the big machinery, ordered, Heaven known how long in advance, will be landed and active work commenced. And thus the game is played from year to year.

The genuine miner and prospector, backed by reputable business people, who are willing to supply him with provisions, clothing, tools, and whatsoever funds may be necessary for a legitimate prospecting undertaking, finding that one miscreant has located whole sections of the country on a single trip, and further finding that nothing has been done in the way of making improvements to comply with the requirements of the law, becomes disgusted with existing conditions and begins to curse both the people who have made such locations and those who have made such locations possible, or, at least, tacitly sanctioned it.

Such is the situation, as it has developed in the Fairbanks Mining and Recording District and what is true of this section of the land is equally applicable to all other sections and particularly to the interior portion of the territory, where placer mining is the only kind of mining carried on and practically the only industry.

Whole sections of land are getting under the absolute control of one individual or concern, and the end is not yet.

On the contrary, the system of land-grabbing, invented, so far as Alaska is concerned, four or five years ago, has only just made its appearance in our midst. The idea of making a twenty-acre location is rapidly fading from the memory of locators, and a location of one hundred and sixty acres is now the standard location and the order of the day.

The origin of the one hundred and sixty acre locations seems to go back to the early day of mining in California, when enterprising miners, finding the working of small strips of land unprofitable from the lack of working facilities, would decide to group or pool their several smaller holdings and, finding such pooling or grouping advanta-

geous, local rules and regulations were enacted whereunder associations of miners could locate one hundred and sixty acre tracts, paying little or no attention to the amount of work and labor to be performed upon such associated locations, for the reason perhaps that immediate and continued working of all ground located was an indispensable condition to the holding of any location. Such continued working being one of the local rules, most strictly enforced in all early mining camps, there was no necessity for any regulation upon that point, as was likewise the case in regard to a discovery, upon such associated locations until finally the courts, recognizing the practice adopted and observed by thriving mining communities, established, by legal decision, that but one discovery is required upon such location and that but one hundred dollars' worth of labor is required to satisfy the requirements of the mining laws concerning annual labor upon such one hundred and sixty acres.

Why courts should thus hold in favor of the larger location is hard to understand, but that question is not now claiming our attention and we therefore pass it over. Suffice it to say that such is the law at the present time and is recognized as such everywhere and thus what may have been a blessing to the early California miners has developed into a veritable curse to the miners of Alaska.

From one end of the land to the other complaints have gone forth condemning the location of one hundred and sixty acre tracts and the staking of any ground by power of attorney.

In every placer camp in the North, the miners working therein have at one time or another protested against these abominations and passed formal resolutions condemning such practices and suggesting ways and means as to doing away with the abuses possible under existing laws and their interpretation. In all instances no relief has come forth, and their petitions have fallen into idle hands and their clamorings upon ears that could not or would not hear.

The only mining legislation passed by congress within recent years and having any bearing upon mining in Alaska is the act requiring the recording of annual labor upon placer mining claims. This law is of no benefit to the practical miner and only tends to work a handicap upon the prospector, whose purse is almost always empty, by compelling him to spend a number of dollars annually in order to perpetuate the proof as to his having performed the assessment work as required by law upon his claims.

The resolutions and suggestions advanced and advocated by the various mining associations of the land at different intervals in the last three or four years may have failed to bring about any beneficial action on the part of congress for the reason that the same were not sufficiently urged though they were in all instances forwarded to the president of the United States, as well as to many influential members of both houses of congress and to many other people high in office and influence.

It may have appeared to them that the evils complained of were trifles for the reason, perhaps, that these outbursts of indignation seemed to occur periodically and that then everything would be quiet again.

Such has indeed been the fact.

Other and perhaps more stirring events have and still are absorbing the attention of the general public, but the fact remains, nevertheless, that the question of greatest and most vital importance to Alaska and its inhabitants and particularly those who inhabit her placer mining regions is the regulation of the acquisition of mining ground by original locators.

Everything at the present time is swallowed up in the hue and cry for territorial government and need of a change in the mining laws is for the moment lost sight of, though the same evil practices that prevailed a year ago are still in vogue and will continue to be in vogue so long as there remains any placer mining ground in Alaska, and they will finally become so far-reaching and all-embracing that a change will have become useless and when the prospector had better resign himself to the inevitable and abandon his dream of home and prosperity in Alaska, and go to work at the sound of the gong for the man who did nothing toward opening up the wilderness and acquiring his boundless placer mining ground at a ridiculously low figure, spends his days on the Outside in affluence which the thoughtless civilizers of the North have made it possible for him to reap.

But in order to convince a body of intelligent people of the existence of a certain state of affairs, whatever it may be, it is necessary to produce facts wherewith to fortify any assertion that may be made regarding the same. General statements and assertions carry but little weight, and seldom receive serious consideration at the hands of those to whom they are addressed.

For this purpose and to the end that those within whose power it may be to do some little good for the people of Alaska, in regard to bringing about a change in the locating and acquiring of mining ground, the writer has made it his special object to examine carefully and critically into the situation. Communications were addressed to all the recording districts of the Territory of Alaska, requesting the co-operation and assistance of the respective recorders in the preparation of tables and statistics setting forth the number of locations that have been made in the various mining districts since their organization. Locations of twenty and one hundred and sixty acres are kept separate for the purpose of showing how the old practice of locating twenty acres has fallen into disuse in later years and how the "habit" of staking one hundred and sixty acres has grown from year to year.

The returns from the different mining districts have commenced to come in, but there are many to be heard from. Only partial returns have so far been received from Nome and at the present time it is impossible to present the case of the entire territory, but such, it is confidently expected, will be possible at some later date, and the writer takes this opportunity to thank those recorders who have kindly complied with his requests.

But as time is precious and as there never seemed a more opportune moment than the present to arouse interest in all things Alaskan, it may perhaps be of benefit to present the case of the Fairbanks Mining and Recording district.

With this point in view all the mining

records of the Fairbanks precinct, almost up to the first day of January, 1910, have been carefully examined and any facts hereinafter stated can easily be verified by a reference to the aforesaid records.

The following tables give the number of twenty acre claims and association claims made in each year since the Fairbanks Mining and Recording district was organized in 1903. The district embraces approximately 11,498 square miles, and placer mining claims have been located within it as follows:

Fairbanks Precinct.	Twenty-acre	Assn.
Date.	Claims.	Claims.
1903.....	2046	26
1904.....	2897	70
1905.....	2886	199
1906.....	931	835
1907.....	285	530
1908.....	286	528
1909.....	204	488

Many interesting comparisons may be drawn from the above table.

It demonstrates that the largest number of twenty acre locations made since the organization of the Fairbanks Precinct were recorded in the years 1904 and 1905, while the largest number of association claims located were in the year 1906. In 1903 there were practically no association locations recorded.

While the number of twenty acre locations has steadily decreased since 1905 the number of association locations has correspondingly increased until in 1909 there were made 204 locations of twenty acres or less each, and 488 locations exceeding twenty acres each.

Another interesting study is presented by a table sent by Mr. U. G. Myers, the commissioner and ex-officio recorder for the Eagle precinct. It shows the increase in the number of association claims while the number of twenty acre claims has steadily decreased.

Eagle Precinct.	Twenty-acre	Assn.
Date.	Claims.	Claims.
1900.....	169	0
1901.....	1014	0
1902.....	1159	0
1903.....	459	0
1904.....	397	2
1905.....	73	6
1906.....	323	84
1907.....	83	124
1908.....	33	68
1909.....	35	59

From the limited investigation so far made it may be safely concluded that some change in the location and acquiring of valuable mineral lands in Alaska is urgently needed.

In what these changes should consist is not now under consideration, the only point at issue at present being whether or not any change, tending to abolish the acquiring of large tracts of land for the benefit of a few is desirable. The two evils always fought against by the genuine miners, prospectors and business men of Alaska are the locating of ground by power of attorney and the acquiring of 160 acre tracts in one location.

With the power of attorney evil we have at the present time nothing to do.

As to the 160 acre locations, we believe that it has been shown to the satisfaction of any man that it is an evil and that the country and its inhabitants are suffering from its pernicious influence.

THE INDUSTRIOUS ALASKA INDIAN

THE NATIVE OF ALASKA IS A FACTOR THAT MUST NOT BE OVERLOOKED IN THE INDUSTRIAL SITUATION. HIS INDUSTRY DIFFERS ONLY IN INTELLIGENCE AND DEGREE.



WHEN one thinks of an Indian, he does not generally picture to himself an industrious man, and yet the aborigines surely have some place in any scheme of industrial development that meets all requirements. Pick up a snowshoe, examine a basket, and more particularly the fibre that binds the various parts together, or take the common canoe which is only a basket shapen and braced in peculiar manner—select any of the above articles common to every Indian family and try to copy it, using Indian tools and implements. Before you have finished your task you will at least agree that the Indian has an industry, no matter what may be said as to their industry in following it.

In his way, the Indian is a busy man; but his lack of method is so in contrast to the method of the white man that we often confuse this condition and out-and-out laziness. My limited observation has led me to conclude that a fair proportion of white men work only when they have to—the proportion among the Indians is larger and therefore stands out more prominently.

The problem which confronts anyone who is working among the Indians is, therefore, industrially two-fold. First, they must be taught to work to better advantage, and secondly, the proportion of workers must be gradually increased.

To set and keep at work an Indian on the very start would have exactly the same result as would come of requiring first reader children to read in the third—

discouragement. On the other hand, it would be as disastrous to require too little. For the Indian, as any other man, must be developed by having enough work to make him grow, but not so much that it will stunt his growth. The mistake which many observers make is in ignoring this principle, for the common practice is to compare the

Indian with the white man, and to measure him by the white man's standards.

The keynote to the successful solving of the Indian's industrial problem is patience. A man in making a canoe gradually shapes the frame by taking off the tiniest shavings imaginable; little by little he completes his task, now laying aside the work



THREE TANANA CHIEFS.

From left to right: Chief William, Village Chief at Tanana; Chief Charlie, Chief of Minto people; Chief Evan, of lower Tanana.



GROUP TAKEN AT SALCHAKET.

These are members of one of the villages who have been very successful with their gardening. They planted 100 pounds of potatoes and garnered 1,000 pounds.

because the wood is not pliable enough, now resting that he may sharpen his tools. In this spirit should the white man influence the native, not impatient for results, but willing to wait when the condition of either the material or the tool require him to.

The industrial problem which faces the Indian of the Tanana Valley is that of changing from a nomadic to an agricultural people. This is being gradually accomplished. Creditable gardens were planted by natives at Tolovana, Nenana, Chena, Salchaket and other points. A few years from now and each native's cabin will have a cellar where vegetables can be wintered. That they are themselves hopeful of results is assumed by their disposition.

A native to whom we had sent seed potatoes was exercised because his potatoes "no come." On inquiry it was found that he had planted his seed knee deep, on the theory that "little deep good, much deep better." His conclusions to the matter is summed up in his own words, "that's all right; he come next year!"

CHARLES EUGENE BETTICHER, JR.
Missionary-in-Charge of the Tanana Valley Missions.

Legislation the Mining Industry Needs

A CRITICISM OF THE MINING BILL INTRODUCED IN CONGRESS BY HON. JAMES WICKERSHAM, DELEGATE FROM ALASKA. BY J. F. ZILMERMAN, GENERAL SECRETARY OF THE TANANA MINERS' ASSOCIATION.



IN the mining bill introduced in congress by our delegate, James Wickersham, he has abolished the association claim and the power of attorney and has thus cut out those evils, root and branch. But no, note section 2, which reads, "That no placer mining claim in Alaska shall hereafter be located by an attorney or agent for another, but only by the locator in person." Why does the bill not make similar provision for quartz claims, or for all mineral claims?

The outsider, the Simon Guggenheim, does not care whether the power of attorney in placers is abolished or not. He deals but rarely in those claims. But he will be on the alert if the power of attorney is abolished in locating all mineral claims. That would touch him at a sore point. The copper, the coal, the quartz, and not placers, attract monopolistic greed. The resident Alaskan needs protection from the abuse of the power of attorney or agency in all mineral claims as well as in placer claims. There is no excuse for this exception. If the bill remains thus, Alaskans can draw but one conclusion.

The bill requires that 100 worth of labor shall be expended annually for every 20 acres or fraction thereof in an association claim. This will receive practically an unanimous endorsement. Making the false swearing of assessment work perjury will also meet with general favor. The bill is silent in providing good faith on location work, an important omission we regret to see. Likewise, the bill does not reinforce the present law in providing more stringent regulations in the marking of boundary lines, a very necessary provision to lessen litigation.

ONE CREEK PER MAN.

While this bill does abolish the staking of placer claims by power of attorney, it is an empty provision if there is nothing in the draft to limit the number of claims a locator may stake on the same creek. There is nothing in the bill to prevent a person from staking and recording in his own name every claim on a creek or in a whole district. What is gained by abolishing the association claim and the power of attorney if the same evil can be continued in a changed form?

Nothing is said in the bill about maintaining and protecting assessment work and making such work a permanent improvement of the claim. Of what benefit to a claim is a 20 or 25-foot shaft when sunk in the muck without bedrock, as is the practice today, if this unfinished work is not protected from loss the following summer? Unless a shaft is protected and preserved in such manner

that it may be sunk down to bedrock later and actually develop the claim, the assessment work is of no permanent value to the claim. Such work may comply with the letter of the law, but does not fulfill the spirit of the law. Some recent decisions imply that this is the rule now, but if so, it is too generally broken by the miners at present to be understood by them as the law. The bill should have strengthened the law in this matter.

FRACTIONS.

Again, we believe it to be a bad practice to provide that the excess of a claim may be cast off from any end or side the locator or owner chooses, provided it is done within a reasonable length of time after request from any person. What if the locator of the fraction happens along when the owner of the claim is hundreds of miles away? Shall the prospective locator of the fraction be compelled to hunt up the owner of the excessive claim? Or, worse still, shall he wait until his return and lose that valuable time? There are too many uncertainties and delays in such a law. A much better rule is to follow the old established custom among pioneers to stake all fractions on the end opposite the initial end. It is the simplest and best rule ever proposed.

The bill provides in another place that after a claim has been surveyed and the plat filed in the recorder's office, no part or portion of such claim or claims may be located, so long as the annual assessment work is done. This in practice would mean that by going to the precaution of having an invalid claim surveyed and the plat filed with the recorder, it would make an invalid claim valid. The delegate, upon being questioned in public if such was the intention, declared that that was the aim he had in view. As miners, we would consider this an exceedingly bad practice, without warrant, dangerous, and bad legislation; absolutely foreign to the spirit which should inspire our mining law. We can never be reconciled to permit this feature to remain in the draft.

COST OF SURVEYS.

In the same paragraph, the bill further provides that when the survey is made by a deputy United States mineral surveyor, the expense of such survey may be applied on the annual assessment to the extent of \$100 for each 20 acres or fraction. We believe that with the exception of the first 20 acres in a group or association claim, the amount is too liberal. It may cost \$100 to survey the first 20 acres, but after that, \$25 additional for every 20 acres in a group or association claim is ample and sufficient. In fact, it is the equivalent of the present contract price of surveyors in this community. This

provision placed in the law to allow the expense of the survey to count on the annual assessment will encourage locators to have their ground surveyed in the early stages of the claim, thus establishing the boundaries before the full value of the claims becomes known, and thereby preventing litigation later on. Any provision which will tend to lessen litigation should be received with open arms.

Further along in the draft, the bill provides that the annual assessment must be recorded, and on failure to do so, forfeiture of the claim shall be the penalty. Those of you who came here from the Yukon Territory will remember that a similar law was in existence there, but in test cases no one lost his claim by failing to record the annual work had it been done. Experience has shown that a jury will never deprive an owner of a claim on failure to record the annual assessment, when same has been performed. Therefore, the requirement is superfluous. Our present law on this point is very satisfactory.

A FEW QUESTIONS.

We wish to ask Delegate Wickersham a few questions relative to this bill. Will it if passed in its original form, conserve the resources of Alaska to those who discover and develop her minerals? As there is no restriction in the bill limiting the number of claims a locator may stake, does the delegate intend that the locator may continue as he does now—stake adjoining claims mile after mile in his own name? If so, what is gained by abolishing the power of attorney and still allowing this right of individual location to remain in the law unrestrained?

Again, where placers are shallow or the mineral is exposed as in the Alaska range, a discovery to satisfy the law is a trivial matter. With such conditions, what is there in this bill to compel locations to be made in good faith? What is there in the bill to serve as a check to land office staking? There is no location work requirement in the bill, and without this, how can the "blanket" and speculative locations be checked? The bill should provide that not less than \$100 worth of good faith work shall be performed within ninety days after location. Location work will stop land grabbing; for the work will not be done unless the locator believes the location is worth it. It is the natural solution for this evil. The bona fide miners and prospectors of interior Alaska demand this much for their own protection.

Without some such provision, the speculator would still have a chance to practice his graft; while the man who discovers and develops the mineral resources of the country is not protected as he should be; but, instead, must pay rich tribute to the former, be his lessee and his tenant, on account of the

strategic position and vantage ground the speculator has gained through the weakness of the law. As it is, the country is continually plastered with speculative locations and the prospector has no ground left for him to prospect which is within reasonable distance of mining centers. The location work requirement should be included in the bill.

IN CONCLUSION.

In conclusion, what is there in this bill

to prevent relocation of mining ground year after year by those who have failed to perform the annual assessment? A good part of Alaska is tied up in this way. This bill should reinforce the general mining law by stating in plain language that any attempt at relocation by any of the original locators who have failed to perform the annual expenditure upon the claim shall render such location void. This will be in line with the last mining act of California, which disquali-

fies the locator from relocating a claim or any part thereof within three years after the date of the original location.

To prevent land frauds in Alaska certain remedial measures must be placed in the bill. The above deficiencies and objections are vital ones and show the bill to be weak in many ways. We trust that when the bill is presented in its final form, the weaknesses pointed out above will be overcome.

A Big Field for the Taxidermist

ALASKA IS THE SPORTSMAN'S PARADISE. MANY FINE SPECIMENS OF MOOSE, CARIBOU AND SHEEP HEADS IN FAIRBANKS. BY HARRY EDWARDS.

As a hunter's paradise the Tanana valley eclipses most of the much-advertised sportsmen's resorts in other portions of the United States. We have here the moose, the largest of all American game animals. The finest specimens of moose horns come from the borders of the Alaskan Pacific. Many of the preserved horns of animals killed in the Tanana valley measure more than sixty inches, and some spread the measure to seventy-two inches. Maine has produced larger moose than are found in Alaska, yet the largest horns recorded are from our own territory. There would seem to be a horn-producing quality in the food that the animals subsist on in this territory.

The moose is not a grass-consuming ani-

mal, owing to the fact that when this animal stands on level ground, its neck is so short that it cannot reach the grass. But he does feed on lily pads and bulbs, is as fond of the water as is a small boy, likes the swamps and marshes, is a good swimmer, and will stand in mud and put his head under water to secure the lily bulb. His principal diet is the tender shoots of the willow, alder and birch, of which he finds an abundance in the Tanana valley.

The caribou is almost our constant companion, and as a meat supply for the miners it is the best ever. We have two varieties of caribou, the woodland and the barren ground. They are very tame. Miners have been known to get their winter's supply of

meat without leaving their cabin doors.

HANDSOME TROPHIES.

Many handsome trophies in the way of caribou heads and horns adorn residences, offices and public buildings throughout Alaskan territory. William H. McPhee has in his place of business in Fairbanks two exceptionally fine specimens of caribou horns, one of which is a curio. The beam measures eight inches in circumference, taken half-way between the burr and the top palmation.

Charles Thompson, of Fairbanks, has also two finely mounted sets of caribou horns. There are none larger recorded in any country, so far as known.

Paul Polson is the possessor of a very

Hunters Making A Killing of Caribou

A Fallen Monarch

He Wont go Hungry



fine caribou head with four brow prongs. This is also an exceptionally large specimen.

Charles Thompson has in his collection a head of a mountain sheep which is a record-breaker for curvature.

There are two specimens of mountain sheep found in the mountains which border the Tanana valley, one the Ovis Dalli, or white sheep, and a second, called black sheep.

L. L. James, of Fairbanks, has a mounted head of a white mountain sheep with a spread of horns measuring thirty-two and one-half inches.

Harry Karstens, of Fairbanks, is the possessor of one of the most symmetrical and best heads of this species of animal extant. The specimen measures fourteen and one-half inches at the base, and thirty-eight and one-half inches in curvature. It was secured near the base of Mt. McKinley.

SMALLER GAME.

Speaking again of the Tanana valley as a hunters' paradise, there are found five varieties of grouse, including the ptarmigan family. Ducks of all varieties, except the wood duck and cinnamon teal, migrate to this section each year. This includes mallards, canvas back, red head, pintail, widgeon, whistlers, green and blue winged teal, butterball, spoon-bill, harlequin, old squaw, together with scamps and surf scooters.

Merganzers and other waders, the blue heron, sand hill crane and English jacksnipe visit the Tanana valley in great numbers during the open season. The Canada goose, the brant and the black-billed swan also pay us a visit during their migrations.

There are in Fairbanks three taxidermists, who are working constantly overtime preparing specimens for shipment to various parts of the world. These three men are R. W. Matthews, Thomas McCool and Harry Edwards.

A Network of Telephone Wires

The old saying that "talk is cheap" is, like many of the old platitudes, true only when judged from a comparative standpoint, and while oral verbosity vis-a-vis costs no more in Alaska than elsewhere, it is a different matter when it has to be indulged in at long range. Therefore when the Fairbanks Telephone company constructed about fifty miles of a telephone system out to the surrounding creeks in June, 1904, in the earliest stages of the camp's development, it demonstrated considerable business pluck and an abiding faith in the future of the district. For the cost of construction and operation of such a system was altogether out of proportion to the income in sight for a period of several years at least.

The office in Fairbanks was opened on September 1, 1904. At that time the line had been constructed to Chena, Cleary, and Fairbanks creek. There were then about fifty 'phones in Fairbanks and ten on the creeks. The farthest point reached was on Fairbanks creek, a distance of about thirty-five miles from the home office.

There was no more building done until

1906. Then lines were run to Dome and Ester. By this time the business had increased to 75 'phones on the creeks and 200 in Fairbanks. In 1907, Vault creek was added to the system. There were by this time about 100 'phones on the creeks and 250 in town. The last addition made was to Little Eldorado, in 1909, and at this time, as at present, it was possible to reach claims on Ester, Cripple, Gilmore, Golden, Fox Gulch, Goldstream, Engineer, Chatham, Cleary City, Cleary creek, Chatanika, Poker, Fairbanks creek, Dome City, Dome creek, Little Eldorado, Vault creek, Treasure creek, Ridgetop and Chena. There are now about 400 'phones in use in the town.

The company has in operation about eighty miles of poles, carrying approximately five hundred miles of wire. It uses the straight metallic system and is equipped with all the latest devices pertaining to it. Eight operators are employed at the local central and the one located at Dome. It keeps on hand supplies ready for any extension to a distance of fifty miles.

Nuggets Are Turned Into Jewelry

Gold is the only "crop" that Interior Alaska has so far produced in large merchantable quantities, and practically the whole output has to be shipped to the outer world to be milled. There is, however, about one-half of one per cent of this production that is reserved here for the use of the men and women whose toil has produced it. This small portion, insignificant by comparison, yet amounting to thousands of dollars annually, is purchased by the local jewelers and molded into the various forms of native jewelry. And there is no jewelry made in any part of the world which carries greater gold value or demonstrates more ingenuity on the part of the artificers.

From Tanana gold skillful workmen evolve chains of all descriptions. There is no limit to the weight except the visible supply of nuggets and the taste of the intending purchaser. The skill used in their construction is best indicated in those where the smaller nuggets are used. One made about a year ago contained 1,200 nuggets, was sixty inches long and weighed but half an ounce, and yet was strong enough for all ordinary purposes.

Besides chains, there are rings of every conceivable design made from the native gold in the local shops, and pins and practically every article of jewelry that can be manufactured Outside. The best workmen to be found are employed here and some of the articles turned out would command attention in the best shops in the world.

In addition to the native gold, there is both walrus and mastodon ivory used in the manufacture of jewelry here, its rich colors adding immensely to the attractiveness of some of the larger articles. The business of the local jewelry stores, however, is not confined to the manufacture of native or nugget jewelry, for several of the larger stores carry stocks of china, cut glass, sterling silver and plated ware, silver deposit ware, art

goods, clocks, watches, diamonds and jewelry as large in variety as are to be found in the best shops of the larger cities Outside. The three principal jewelry shops in Fairbanks carry an aggregate stock exceeding \$100,000 in value.

The Test Stamp Mill. A Home Product.

No better monument to the resourcefulness of the Tanana exists today than the test stamp mill made in Fairbanks a little more than a year ago. The quartz prospects had developed to such an extent during the winter that urgent necessity arose for a mill wherein tests of the ore could be made without the delays attendant on the shipping of the ore outside.

The question arose as to whether it would be possible to build a mill here. It was immediately answered in the affirmative. There were no blue-prints, plans or specifications to work on; only a half-tone picture on the back of a machinery catalogue. All the patterns had to be made originally, a work which consumed two weeks. Then they went ahead with the castings. Some of these were a considerable contract for the local foundry to assume, that for the mortar weighing 750 pounds.

The mill is of three-stamp capacity, triple discharge, with an amalgam table. The stamps are on the gravity system and drop of their own weight. Each stamp drops eighty times per minute, and the three stamps will reduce from three to five tons per day, according to the resistance of the ore. The ore is fed into slots and discharged onto the amalgam table. Within the bases of the stamps are amalgam plates to retain the gold, but what gets by them is caught on the 4x8 amalgam table.

The mill is built upon a solid foundation, to stand the test of time, and is nicely housed in a building built especially for it. The mill is driven by electric motors.

How I Raise Potatoes in the Tanana.

About April tenth I increase the heat of the cellar or room where the seed potatoes are stored, so the sprouts will be well developed by the first of May. As soon as the frost is out to a depth of six inches on well-drained ground—that is about May third or fifth—I plow and harrow the ground, furrow and drop the seed on the bottom of the furrows, cover lightly with stable manure and about two inches of soil; follow immediately with roller or float to press the soil down, which promotes moisture.

As soon as the potatoes are well above the ground, commence shallow cultivation, and continue until the blossoms are well out. I use only the earliest varieties grown. By August 20 I begin digging and storing for winter in this manner: Dig on dry days only; let potatoes dry for three or four

hours; sort them into three classes. The largest are put by themselves, and the medium, which are the best for market, are put by themselves. These two classes I handle as carefully as one would apples, by placing them in crates without bruising, and storing them with plenty of air space clear around them. The small ones I put into bins for

stock feed or other purposes. So much for the culture and the storing.

Now about the ground: New raw ground will not raise good potatoes here in the Tanana. Ground two or three years old that has been well drained and pulverized will raise good dry potatoes, provided the seed are of the right sort. The older and better the soil the better the potatoes.

I have raised the best potatoes from seed from the state of Maine. They should be planted before May 15. Late frost will only stop the top growth a day or so, and does not injure the roots. This system has proved successful five seasons for me. Do not experiment with late potatoes yet; when your ground is older is time enough.

HARRY BUZBY.



Ben Levi's God

BY ROBERT RUSSELL STRANG.



*Men kneel no more in the altar's pale
To the gods of their fathers old;
But worship and slave for a six-foot grave
The merciless god of gold!*

Ben Levi's heart was a heart of stone,
His body was lean and dry;
Thro' either cheek stuck a famine bone—
Deep sunk was each fish-cold eye.
From Mexico clear to Nome he'd trod,
Till now, withered, weird and old;
He bowed no more to his father's god,
But worshiped the god of Gold!

Time was when he'd starve to play the game,
Or pawn his coat for a chip;
In each bulging eye a ghost-like flame,
A foot between lip and lip;
For days at a stretch he would watch the ball,
The banker's hand and the wheel,
Till, by gods of all Jews, he'd bank all and lose—
Or break up the bank in the deal!

The climax came in a dive in Nome,
Mid putrid thoughts and reek;
With crowds at the tables in parkas to sables,
An' suckers just fresh from the creek.
He had played three days an' had played three nights
(In five figures he'd counted his roll);
But when he crawled forth 'neath the northern lights
He had naught but a thread-bare soul.

* * * * *

Three years passed over Ben Levi's head,
Just he and his God know how;
With his heart of stone and his soul of thread
He vanished that night in the snow
And the wilderness swallowed him up; but he lived
By a vow to the soul he had sold,
Made that night in the dive, when but half alive—
To the merciless God of Gold.

When he struck it so rich that he feared 'twas a dream,
He wept, prayed, and vowed in turn;
He clutched and caressed it, and cursed it, and
blessed it
Till his eye like two coals did burn;
Then the fear almost choked him that others would
come;
"O, curse them, God! curse them!" he cried,
While with hands thin and cold he kept fondling the
gold
Till exhausted he sank by its side.

For months he worked fev'rishly, fearfully on;
And the pile of gold grew and grew;
Till it girdled his soul and his heart of stone,
And owned him as it would own you!
But one night as he fondled his mound of wealth
A thought struck him awesome and evil,
And the old gambling spirit o'ertook him by stealth
And he shouted, "I'll play with the devil!"

He made a rude wheel on his cabin floor,
And muttered great oaths 'neath his breath;
Gave the devil his share of the yellow store
And hissed, "We will play to the death."
How he laughed when he won, how he cursed each
reverse,
While the days passed one by one,
Till he rose one night and exclaimed with a curse,
"It's all mine! I've won! I've won!"

And over the wheel fell a skinful of bone,
Two glassy eyes and a beard;
For the threadbare soul thro' the night had flown
Thro' the still white night so weird.
And they found him there frozen as stiff as a board,
Ben Levi, the gambler who sold
His soul for a golden thread-held sword
To the merciless God of Gold!

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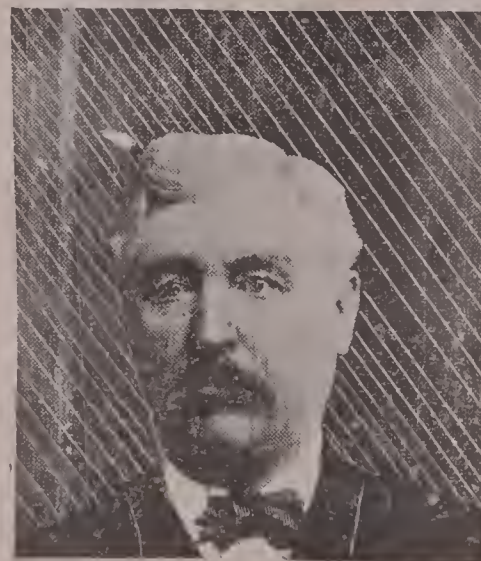
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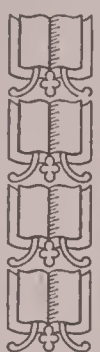


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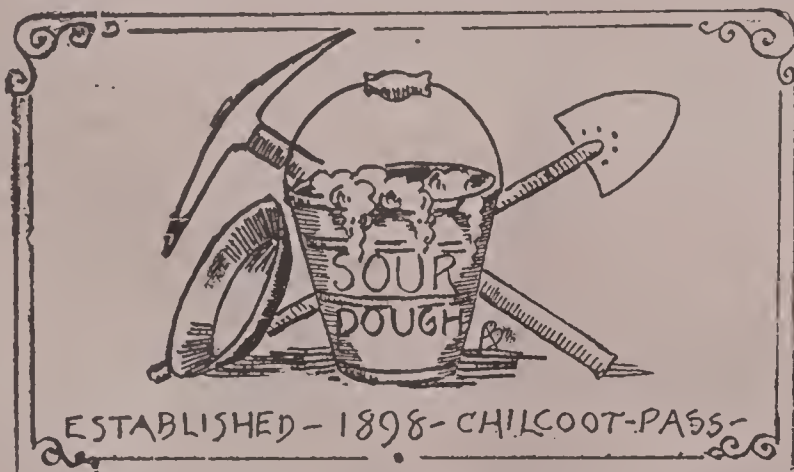
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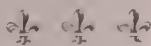
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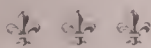
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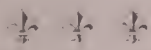
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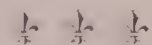
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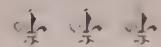


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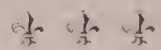
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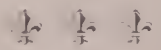
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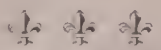
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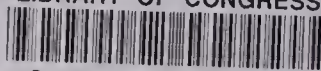
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